AN ARCHEOLOGICAL SURVEY, ASSESSMENT, AND RECOMMENDATIONS FOR THE OHIO FLAT MINING DISTRICT (CA-Tri-943), TRINITY COUNTY, CALIFORNIA

by
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and
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Front Cover: Chinese and Euro-American Miners posing by their placer operation during the Gold Rush days in northern California.

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PREFACE

One of the more conspicuous, common and yet amorphous historic remains in northern California are the tailings left behind by the historic gold miners. Yet, a close examination of some of these tailings reveals a variety of often discrete features, something more than homogenous rock piles. Occasionally, these features--hidden away in the forest--can be monumental.

The informational and interpretive character of the various features is often lost to the casual observer. Only within the last few years have historic archaeologists focused attention on these remains. And the explanatory results have been surprising. It is even more interesting when a complex of these features can be in part ascribed to an ethnic group such as the Chinese, now virtually gone from the region. Such was the case at Ohio Flat, assigned a Smithsonian number of CA-Tri-943.

Initial attention to these features resulted from the Federal cultural resource law compliance process as tied to land development or directed change. Several wildlife biologists in the Bureau of Land Management (BLM) in Redding, while inspecting a proposed river sediment disposal area on BLM lands, were struck by the size and complexity of some tailing features observed. They reported these to me, the BLM archaeologist for the region, and I conducted a field inspection. The Department of Water Resources (DWR), the lead in improving the salmon spawning beds in the Trinity River, was interested in the tailings as a disposal area. I determined that prior to any such action this complex needed a full significance evaluation by a team of historic archaeologists. I was aided in this opinion by local historians Hal Goodyear and Herb Woods who inspected the site and judged it to be the most significant tailing feature complex in the county.

Subsequently, DWR contracted with the Department of Parks and Recreation for the full evaluation resulting in this report and confirming the importance of the complex. A compromise was reached between BLM, DWR, and the Office of Historic Preservation for sediment disposal, and new tailings were placed on a portion of the complex judged to be less significant. The new tailings have been carefully contoured to the level of the old adjoining tailings still extant and the new tailings have subsequently been re-planted.

With the initiation of the fisheries improvement project, an important historical study has resulted and DWR has been able to accomplish its river improvement goals. In this manner the interests of the public have been well-served: better fisheries, increased knowledge of historic mining methods, and an improved understanding of Gold Rush times and later miners and their operations and their place in the development of the region to this day.

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INTRODUCTION

The Department of Parks and Recreation, under an agreement with the Department of Water Resources and the Bureau of Land Management, studied an extensive nineteenth-century mining site (CA-Tri-943) in May and June 1984. The 30-acre plus site is located along the south bank of the Trinity River about 3 miles southwest of the town of Lewiston in Trinity County (Section 27, Township 33 North, Range 9 West, Mount Diablo Base and Meridian, Weaverville quad).

The Department of Water Resources has proposed this location as a debris-dumping area for their fisheries improvement program along the Trinity River. The Bureau of Land Management, which manages the public land, required that the Department of Water Resources provide an assessment of both significance as a historic mining site and potential for the National Register of Historic Places per law. Also, the Department of Parks and Recreation was asked to assess the interpretive potential of the site and to suggest any mitigation which would be necessary to preserve specific features and zones.

This report constitutes the Department of Parks and Recreation's recommendations on the best use of this property, recognizing National Register potential and the preservation of specific features for future study and interpretation.

PROJECT DESCRIPTION

The project site has been known by various names in the historic literature. At times, it has been included in the Lowden Ranch Mining District, the Lewiston Mining District, Grass Valley Creek, and the Ohio Flat Mining District. For clarity, this report will refer to the area as the Ohio Flat Mining District.

The Ohio Flat mining area is old gravels on a bench bordered on the north by the Trinity River, on the east by Grass Valley Creek, on the south by steeply rising hills and a flat bench along Grass Valley Creek, and on the west by the Poker Bar Mining District, which is made up of more recent river bar gravels. This bench lay in the middle of extensive mining activity which extended for miles along the Trinity River and its tributaries. From the historic record and field investigation, it appears that the area was being mined as early as the 1850s and probably was continuously mined until around 1900. Ground sluicing appears to have been the most common technique, with wooden sluices also used. It is possible that limited hydraulic mining also occurred. In some areas, it is evident that at least 15 feet of overburden and gravels were removed in the search for gold.

In the earliest mining activities, extensive networks of ditches supplied water to the mining areas from a main feeder ditch. Later, as the gravels were worked deeper, wooden flumes were employed to deliver water to the workings, and deeper and deeper drain ditches were employed to remove waste water and wash the gold in ground sluices along these drains. Some areas appear to be dug deeper than the drains, and it is not known whether elevators or pumps were in use. Most likely, material was removed by being wheelbarrowed up to the sluices or pitched into elevated sluices, with the boulders stacked

to the sides. Many of the boulders are large, and it would appear that cranes or winches were in use to lift these rocks onto the tailings piles. In all cases, enormous amounts of labor were used to develop the mines, stack rocks, dig ditches, and build and maintain the sluices.

Other expected features of the site are missing or have not been recognized. The feeder ditch system needed to provide the large amount of water to the site, for example, is not clearly understood due to disturbance by private development. It is located off the project area. The residential area of the miners has not yet been defined, although two and probably three house sites on adjacent land have been tentatively identified.

The extent of mining activities on the site have disturbed much evidence of earlier workings. The jumble of tailings and rock piles can be understood through its obvious use as a debris dump. Most evidence of the technology or early mining strategies used in these areas has been destroyed by the refuse of more recent activity. The boulder piles stand in high contrast to other areas where flume lines, dams, sluices, trails, and walls remain to give us an understanding of the techniques used to mine the gravels.

Since these preserved features can tell us much about the technology and sequence of mining activity, they should be saved for future study as well as for their unique industrial significance.

HISTORIC BACKGROUND

DISCOVERY

The discovery of gold in California in 1848 attracted the attention of the world within a matter of months. Fortune hunters made their way to Northern California as quickly as possible. But even before the famous Marshall find on Sutter's territory, Major Pearson B. Reading had discovered gold in 1848 at Clear Creek in what is now Shasta County (Hart, n.d.:1). Within four years after Reading's discovery, there was a gold rush along the Trinity River into Trinity County (Bancroft VI, 1888:506).

Trinity County historian Issac Cox, writing in 1858, captured the gold rush spirit that engulfed the county. Cox, in his Annals of Trinity County, reflected on the rapid growth of the county after the discovery of gold, despite the relative remoteness and obscurity of the area. The project site is located in what has become known as the Ohio Flat Mining District and later the Lowden Ranch Mining District, an area of major activity in this early period.

FIRST SETTLERS

Many of the first miners to work river claims along the Trinity River were German immigrants. Issac Cox (1940:31) reported that a company of six Germans mined $32,000 of gold in 1854 at Turner's Bar. Three miners, led by Lewis Ludwig, filed a claim on the riverbed one mile below North Fork in October 1854 for the purpose of setting up a fluming operation in the summer of 1855 (Trinity County Deed Book D:534).

In the fall of 1854, a company of ten miners, seven of them with German names, filed and recorded a claim on what they identified as "the diggins on Grass Valley Bar." Like the Ludwig company, this group announced its intention to build ditches in preparation for a fluming operation. Located in Grass Valley, Trinity County, the miners named their company the Ohio Water and Milling Company (Trinity County Deed Book D:534). In all likelihood, the Water and Milling Company took its name from Ohio Flat.

One of the first improvements that the settlers made was the construction of water ditches. The Grass Valley Creek area included the George Frederick, the Old Skinner, and the Ranch ditches. Apparently, the Old Skinner Ditch was built in 1851. In the following year, the George Frederick Ditch connected the west bank of Grass Valley Creek with Ohio Flat, and the Ranch Ditch linked the waters of the creek with Lowden's Ranch.

Cox (1940:23), writing in 1858, mentions the "German Ditch" which, he claimed, was 6 miles long and could accommodate 20 sluice heads. It is quite possible that the German Ditch may have been another name for one of the ditches already mentioned. Historian James Bartlett, who later updated Cox's Annals, added that the "German Ditch":

> . . .was constructed at an early date for carrying waters for mining to the base of Grass Valley Creek known as "Ohio Flat" and at a later date to the base on Trinity River which the annalist styles "Polka Bar" but which in later years has been known as "Poker Bar" (Cox 1940:205).

RANCHING AND FARMING

Although mining was the main attraction for many settlers to the area, ranching and farming developed as important pursuits. For those settlers who decided to remain in the region, it was usually necessary to survive through a combination of ranching, agricultural, and mining pursuits. That is why the development of a ditch system was critical for the Grass Valley Creek area. Ditch systems also provided irrigation for agriculture and power for mills, as well as for placer mining.

The historic landmark most closely associated with the Ohio Flat area is Lowden's Ranch; in the county deed books, the site area is within the boundaries of the Lowden's Ranch Mining District. William Lowden was not the first Euro-American in the Grass Valley Creek area, but he may have been the most successful and influential. The ranch was located along the Shasta to Weaverville trail at the mouth of Grass Valley Creek, a stopping-off point for activity at Point Bar and Polka Bar (Poker Bar).

William Lowden settled in the Grass Valley Creek area in 1851. He built the Weaver and Shasta Turnpike Road which passed through the center of his property (Trinity Journal, August 7, 1858) and a bridge over the Trinity River from which he collected a separate toll yielding him $400 a month.

Apparently, what made Lowden successful was his ability to acquire water rights sufficient enough to irrigate his entire ranch. Because of the location of the ranch, he had markets for his products both in Shasta and Weaverville. The Trinity Journal on August 7, 1858 gave this glowing description of the Lowden spread:

> The following is the account of property given the assessor this year; 75 acres of barley, 5 of oats, 2 acres of corn, 32 of potatoes, 4 of turnips and beets, 2-1/2 of onions, 7 of timothy, 5 of melons and pumpkins, 3 of cabbage, 1,500 apple trees, 1,000 peach trees, 15 pear, 300 plum, 40 cherry, 200 currants, 200 grapes and one-half acre of strawberries.

The article mentioned other ranch assets, including a $4,000 sawmill. By 1858, Lowden's Ranch dominated the Grass Valley Creek community.

Two other early settlers, Lucas and Fred Frey, original members of the Ohio Water and Milling Company, were often involved in disputes over water rights. Their claims included litigation with the Lowden family. Born in Wurtemberg, Germany, the Frey brothers left their home during the revolution of 1848, arrived in the United States in 1850, and in Weaverville in 1852. They remained in the vicinity of Lowden's Ranch for the rest of their lives (Biographical File, Trinity Historical Society).

A close friend of the Frey brothers in their early years at Grass Valley was L. A. Noyes, a resident of Lime Gulch near Carter Bar and Point Bar. In a most revealing letter to the Freys, Noyes showed the extent to which water rights preoccupied the early settlers:

> I was at your place on last Wednesday but to my sorrow did not find you at home. Examined all the ditches found about one thousand inches in all running near hear (sic), but a little more in my old ditch, than would be necessary to keep the flooms (sic) wet. You are not under any obligation to furnish one drop for any such purpose. . .
>
> You must know how near they came winning a right by prescription. And they are likely to magnify a few inches into hundred of inches. Your rights are pretty well secured to you now, if you look well to them in the future, be prepared at all times for an emergency, for you have bad men to deal with. However cowardice is generally coupled with meanness and will never strike in open nay be patient and await the proper time to move in the matter (Noyes 1855).

Presumably, the "bad men" were rival miners or settlers who ignored the Freys' exclusive claims to water rights emanating from their ditches.

Euro-American interest in the mining potential in the Grass Valley Creek area appears to have waned by the end of the 1850s. Chinese miners in Trinity County turned their attention to the project area.

ARRIVAL OF THE CHINESE

Although the Chinese probably arrived in Trinity County as early as 1851, according to the testimony of early Trinity pioneer Theodore E. Jones, their presence in the county was not particularly noticed until 1853. In the spring of that year, Chinese miners flocked into the region. The Shasta Courier (April 14, 1853) estimated that a thousand Chinese entered the county in the first two weeks of April.

The news of the discovery of gold in California had first come to the attention of the Chinese when rumors of the event spread through Hong Kong (Du Fault 1959:155). The earliest Chinese arrivals to California came from the Kwangtung Province and the Pearl River Delta in some of the most heavily populated regions of China (LaLande 1981:323). The origins of the miners reveal a great deal about their apparent mining skills. These particular immigrants were familiar with agricultural irrigation techniques that could easily be adapted to hydraulic engineering for mining.

From the very beginning, Chinese miners in Trinity County concentrated their efforts along the river, which in the early years placed them in competition with Euro-American miners. In May, 1853 Euro-American miners voted 65 to 63 to allow Chinese miners at Big Flat the same rights as other foreigners (Brott, et al. 1982:9). Working river claims was an extraordinary challenge. After the quick money was made, it was next to impossible to work these claims alone. One Euro-American miner by the name of Hahn hired a Chinese company of 43 to work his claims at Union Bar (Brott, et al. 1982:9).

As the decade wore on, however, it became more and more common for the Chinese companies themselves to pursue the claims. Chinese miners, here as in the other areas of California, worked claims in which other miners had lost

interest, that required lengthy development, or that were labor intensive. Wing damming was a favorite way of mining the riverbed claims, a labor-intensive methodology that required extensive log cutting and manual labor. By 1856, there were Chinese companies all along the river (Brott, et al. 1982:14). Apparently, in the last years of the 1850s, both Euro-American and Chinese miners worked the river.

By April of 1859, there were almost 300 Chinese working between Minersville and Lewiston. By the end of the year, Lewiston had attracted enough Chinese miners to justify the construction of a chapel there (Brott, et al. 1982:18). The Trinity Journal (April 21, 1860) followed the activities of the Chinese along the river very closely and grudgingly acknowledged their success. The summer of 1860 witnessed a flurry of flume building by the Chinese, especially between North Fork and Big Flat. This occurred precisely at the time that Euro-American miners were losing interest in the area. "The Celestials make it pay where the white man cannot" commented the Trinity Journal (June 23, 1860). Another indication of the success of the Chinese at this time was the fact that they were refusing to work for Euro-American miners unless they were paid high wages (Trinity Journal, September 22, 1860). In December 1860, when the Poker Bar Ditch opened for the first time, Chinese miners outnumbered Euro-American miners five to one (Trinity Journal, December 15, 1860).

The first Chinese name directly associated with the Ohio Flat area was that of She Lim. On November 10, 1860, he made this claim:

> The Undersigned Company of China men (Twenty men) has taken up for mining purposes twelve hundred and fifty feet of ground situated below the mouth of Grass Valley Creek and above a point where Frey's Flume Conveying water from Grass Valley Creek Crosses the Trinity River. Said claim is a bank and river claim and was located on or about the first day of October AD 1860.
>
> The above named mining claim is situated on the same side of Trinity River that Lowden's Ranch is on.
>
> Signed,
>
> She Lim (in Chinese characters)
>
> Filed and recorded Nov. 10, 1860 at the request of Chinamen.
>
> (Trinity County Recorder's Office)

One reason for the success of the Chinese during the 1860s was their decision to form large companies that made labor-intensive mining more feasible. By this time, sluice mining dominated all other techniques, and it was employed with considerable success by Chinese miners, who obtained water through flumes from either a higher elevation or by water raised by a China wheel (Robertson 1970:13). In 1866, the Trinity Journal (April 28, 1866) admitted that the Chinese owned some of the most lucrative claims in the entire county.

Chinese miners and mining companies operating in Trinity County were able to circumvent the requirement popular in other parts of the state of filing property and mining claims through white middlemen. Trinity County's official records indicate that many individual Chinese miners as well as Chinese mining companies filed land and mining claims without assistance from whites.

Chinese miners stayed with their claims longer than their Euro-American counterparts. The kind of sustained energy exercised by the Chinese is captured in this account by a local reporter:

> Poker Bar is quite deep, the channel generally being deeper than the surface of the river at low water stage. The bedrock is rich on the pay streak; several years ago Chinese miners wheeled off 20 feet in depth, until they reached the water level, then drained with pumps and packed the dirt to the river where it was washed in rockers. For so much labor, performed in such a slow manner and under such disadvantages, it would require very rich bottom dirt to pay even expenses. High water filled the claims up and they were not re-opened (Trinity Journal, May 4, 1872).

MINING ACTIVITIES IN THE 1870s, '80s, AND '90s

Throughout the decade of the '70s, when increasing numbers of Euro-Americans abandoned mining possibilities, the Chinese continued to mine. Much of this activity was within the boundaries of the Ohio Flat Mining District. In midsummer 1872, the Trinity Journal (August 3) reported:

> Trinity River has nearly reached the low stage of water, and the Chinese miners are preparing to engage in wing-damming. There are about 70 of this class of miners between Lowden's bridge and Douglas City.

In 1873, the Trinity Journal, which had shown remarkable restraint during previous periods of anti-Chinese hysteria, now advocated immigration restriction. The reasons behind the calls for a stop to Chinese immigration reveal a great deal about this period in Trinity County. The paper claimed that the Chinese now outnumbered adult whites. And the Journal (May 31, 1873) further charged:

> Trinity River seems nearly given up to them, in many places for miles and miles none but this class of miners can be found.

But the simple numbers equation was not the sole source of apprehension for Euro-Americans. The year 1873 marked the beginning of a world-wide depression from which even the remote confines of Trinity County were not exempt. Prospecting had served as an economic safety valve for Euro-American residents. But what worried the editors of the Journal was the realization that the Chinese had such a strong hold on bed and bank mining that there would no longer be opportunities for what the newspaper categorized as "Laboring Whites."

Antagonism towards the Chinese increased even though few Euro-Americans could have imitated the river mining practices of the Chinese. Despite local hostility, the Chinese continued to mine along the Trinity River, hiring Euro-Americans to facilitate their land dealings (Trinity Journal, May 31, 1873). The Journal (July 5, 1873) reported that impressive numbers of Chinese were preparing for riverbed mining in July of 1873.

Not all Chinese mining operations were successful. The Journal usually carried notices for the Delinquent Tax List, on which Chinese names frequently appeared. When the Chinese failed to pay taxes, it was almost always a sign of economic crisis. They were usually loyal taxpayers, even of the unfair Foreign Miner's Tax. The locations of the mining claims were not always given. In the Journal of February 7, 1874, however, Am Foy and Co. was on the Delinquent Tax List, with the claim noted as "opposite Poker Bar."

One of the Trinity County pioneers connected to both the Chinese and the Euro-American communities was L. A. Noyes, who is quoted above in a letter to the Frey brothers. Arriving as a gold miner in 1850, he settled in the county and later lived with a Chinese woman; in 1871, he purchased a Chinese infant, whom he raised as a daughter (Karch 1980-81:15). Noyes' correspondence with his friend T. Tuley, a Weaverville merchant, indicates the constant traffic of the Chinese between Weaverville and the river area in the late 1860s, the status of some Chinese as merchants, and the wide variety of work performed by Chinese in the area in the late 1860s-1870s.

Despite the anti-Chinese prejudice of the 1870s, the Frey Mine ledger of 1874-1875 shows the use of Chinese laborers in "the ditch." Apparently, Chinese workers often provided the bulk of labor for local ranchers. In a letter that Mehitable Lowden wrote to her son Francis July 12, 1879, she mentioned that she had hired 12 Chinamen to repair the local roads.

By 1880, the Chinese population in Trinity had risen to 1,836, probably a conservative figure. The highest concentration of Chinese was in Weaverville, with a figure of 494. Lewiston followed with a population of 304. The high number of Chinese in Lewiston suggests that miners may still at this late date have been using this community as a starting off point for riverbed and bank mining operations.

Interestingly enough, within the next five years, the Chinese population of Trinity experienced a dramatic decline. By 1886, the number of Chinese in Weaverville had fallen to below 100. Lewiston's population likewise dropped, but not as sharply as those of other districts in the county. Of the remaining Chinese, the majority eked out a living pursuing abandoned claims along river bank streams. Lewiston had long been the center of such operations, and it remained the most vital center for the Chinese in this period of economic decline. Outside of mining, the Trinity Journal (April 24, 1886) enumerated the occupations of the Chinese in the county:

> There are probably 20 Chinese cooks employed in the county and not to exceed that number of the same people in the employ of whites in mining and other work. A few are engaged in gardening and cutting wood, and the remainder are storekeepers, opium joint proprietors, gamblers, etc.

The Chinese remained involved in mining in Trinity County well into the twentieth century, but those who remained belonged to the few Chinese companies still in operation. In 1894, the Noyes and Sutton mine, which comprised 80 acres of patented land in the Lowden's District, was classed as a placer mine, with the owners simply labeled as Chinamen (Stockwell 1894:36, 37).

The Paulsen family, one of the most influential in Trinity County, had extensive dealings with Chinese miners throughout the last quarter of the nineteenth century. Peter Paulsen, one of the fortunate few who had early success at commercial mining at Turner Bar in 1855, lost most of his early fortune and dabbled in various mining ventures throughout the county for almost 20 years. But in 1874, he co-founded the Weaverville Ditch and Hydraulic Mining Company, and eleven years later, with O. W. Loveridge, established the Trinity Gold Mining Company (Lewis 1891:303-305). Reports in the Journal (January 27, 1877) indicate that Paulsen sold claims to the Chinese and hired Chinese companies to work his own. In 1895, Wang Chung, along with his partners, sold to Charles Paulsen ditches and water rights associated with the Lowden Placer Mine for $300 (December 14, 1895). The Paulsens may have been competitors of the Chinese in the later part of the nineteenth century, since they were engaged in hydraulic mining at various locations in the county (Trinity Journal, January 8, 1898).

In 1900, Peter Paulsen sold most of his extensive mining holdings in Trinity County to the Last Chance Gold Mining Company, a corporation organized under the laws of New Jersey (California Miner, Feb. 15, 1900:1). Part of Paulsen's holdings were located within the Lowden Ranch Mining District, specifically on Ohio Flat. The Ohio Flat Placer Mining Claim is defined in this transaction, as originally filed by W. J. and W. S. Lowden in February 1876:

> The SE 1/4 of SE 1/4 of NE 1/4, the N 1/2 of NE 1/4 of SE 1/4 and SE 1/4 and SE 1/4 of NE 1/4 of SE 1/4 of Section 27 of Township No. 33 North of Range No. 9 West of Mount Diablo Meridian. Containing 40.00 acres situated in the Lowden's Ranch Mining District, County of Trinity, State of California (Trinity County Miscellaneous Book 10:248).

The ditch systems in the Grass Valley Creek area are also described in the acquisition, since the Last Chance Mining Company also purchased most of the water rights pertaining to mining claims in the Lowden's Ranch Mining District. The company intended to build a ditch from the South Fork of Grass Valley Creek supposedly to hook up with the existing ditch system that had been in a constant state of flux for a half century (Trinity County Deed Book 26:576). There is no doubt that the ditch system was active all throughout the decade of the 1890s. For example, the thirteenth report of the State Mineralogist mentioned the expansion of the Grass Valley Ditch, which the author called the Frye Ditch. As of 1896, 8 miles of a proposed 11-mile ditch had been completed. Other than the fact that it ran from Grass Valley, however, the exact direction of the ditch was not given (Crawford 1896B:560).

MINING AND THE TWENTIETH CENTURY

Mining activity continued throughout the first half of the twentieth century in the Lowden's Ranch Mining District. Perhaps the most dramatic operation that occurred near the site was that of the dragline dredge along Poker Bar. Initiated by Interstate Mines, Inc. in 1939, the project called for the dredging of 2,250,000 cubic yards of gravel (Averill 1941:40). Mining has remained an important resource for Trinity County into the 1950s and 1960s. Total figures for all minerals extracted shows a steady increase from $561,555 in 1947 to a high of $2,354,765 in 1958. Mineral figures average close to a million dollars a year for Trinity County during the early part of the 1960s (Spuller 1962:19).

SUMMARY

After the discovery of gold, Trinity County, as with most of California, underwent a tremendous population boom. In many ways, mining activities at the Ohio Flat Mining District followed patterns that were common in other gold mining areas, with some interesting differences. Normally the first miners to arrive at the gold fields, and thereby receive the best opportunity for riches, were generally Euro-American miners. This was common throughout California and holds true for the project area. It is interesting to note that the first arrivals to the project area were of German ancestry.

Minorities in the gold fields tended to take second place to Euro-American miners. This held true for Chilians, Mexicans, and Chinese miners throughout the state. Claim jumping, robbery, verbal threats, beatings, and of course outright killings were used to harass foreign miners. Perhaps the best example of institutionalized discrimination used against foreign miners was the foreign miners tax passed by the Legislature. Anti-foreign agitation in the early '50s was so great in many areas that it was directly responsible for many Latin American miners abandoning the gold fields (Paul 1947:111).

One certainly would expect that Trinity County would be within this pattern of discrimination against foreign miners. This study reveals that Trinity County does not readily fall into any typical discriminatory pattern. As with other sections of the state, Chinese miners generally had to first work claims abandoned by Euro-American miners. After the easy money had been extracted by Euro-American miners, most claims required enormous amounts of physical labor. Chinese mining companies in Trinity County readily lent themselves to this labor.

This study indicates that Chinese miners in Trinity County and in the project area eventually established their mining independence. In various mining districts in Trinity County, Euro-American miners voted to allow Chinese miners certain rights. Eventually, Chinese miners filed all their own mining claims with county officials. This study has found documentation to suggest that the Chinese actually filed claim to what turned out to be some of the better river areas to mine, and that the Chinese would interact with Euro-Americans when necessary to facilitate their mining interests.

Historian John Caughey suggests that there might even by a symbiotic relationship between the Chinese miners and white merchants. Caughey, writing of the friction between two Chinese mining companies in nearby Weaverville in

the summer of 1854, indicates that white merchants had much to gain in sales from the Chinese. By 1854, the friction between the Yangwa and Canton companies had increased to the point of physical battle between the two companies to settle a point of honor. The merchants of Weaverville's hardware stores, blacksmiths, and tinsmiths benefited in outfitting and selling arms and armor to the feuding fractions (Caughey 1948:195). The outcome of the battle cost the lives of two of the Yangwas who were victorious, and six of the Canton company. Perhaps as interesting as the financial gain of the merchants over the fight was Caughey's reflection that after the battle:

> . . .the Weaverville Americans professed to have greater respect for these Orientals who, in an affair of honor, had been willing to fight to the death (Caughey 1948:196).

The Chinese in Trinity County, as throughout California, were not spared the anti-Chinese agitation during the turbulent 1870s when most of the country suffered through a major depression. Even though the Chinese population continued to decline by the end of the nineteenth century, Chinese miners remained an important work force in Trinity County into the twentieth century.

CULTURAL RESOURCES

FIELD METHODS

Field recording of the cultural resources present on-site took place April 15-18 and May 14-16, 1984 and October 9, 1985. The initial field problems were to determine 1) what meaningful units the site could be broken into for recording purposes, and 2) what level of detail of recording was possible and warranted, given the objectives of the project, as well as time and funding constraints.

Under the terms of the interagency agreement, the State Department of Water Resources (DWR) provided contour maps of the site (2-foot contour intervals, 50- and 100-foot-per-inch scales). These were prepared from aerial photographs flown in the 1970s, supplemented by recent on-site survey work. This plan shows some but by no means all of the major cultural features as bold dashed lines. Copies of aerial photographs and other less-detailed boundary drawings were also provided. The agreement specified that DWR surveyors would return to the site after the cultural resource survey was complete to add additional features to the map as needed (Appendix B).

A number of recently constructed buildings and graded and filled areas on adjoining private property are not shown. Selected trees are plotted on the site plan and have been marked with metal tags with numbers corresponding to those shown on the map. This was considerable help in plotting mining features. Although the scale of the maps and the complexity of the site prohibited a detailed recording of every feature on the site, it was not difficult to schematically plot major features with reasonable accuracy. The 100-foot-per-inch reductions were used for field recording, due to the unwieldy size of the larger sheets.

Using the maps provided, the survey crew members each took a different portion of the project area and began to plot the more substantial features. It soon became apparent that most of the mined area is composed of a series of separate drainage systems, usually with smaller ditches leading into one or more major drains. These drains eventually exit to the river. Twenty-two of these separate "Drainage Areas" were identified and became the primary units in which the mining features on the site were recorded (Appendix B). Each was assigned a consecutive number. These are in effect separate placers, which represent different time periods and, in some cases, different modes of operation. Two additional units, containing primarily water supply and distribution features, were also identified and numbered. The placement of the boundaries of some of these units might be debated, and some units further subdivided. In general they reflect the historic operation and evolution of the site. Each unit is described in this report. A separate section discusses the possible chronology in which these units were worked.

A member of the field crew was assigned to record the features present in each unit. This consisted primarily of plotting them on the maps, supplemented by narrative descriptions of each unit (Appendix B). Descriptions include size and orientation comments on the general topography, as well as selected features in each unit. These include observations on some of the most

typical, impressive, well built, or unusual features. Selected areas and features were photographed using black and white print film and color slides (Appendices B and D).

As work progressed, the crew began to observe several common types and patterns of features occurring in different sections of the site. No attempt was made to number or individually record each separate feature due to the large number present and the difficulty of segregating individual elements from what are, in reality, integrated networks of features. A feature typology was devised which divided major elements into categories based on function and morphology. Descriptions of each of these categories, along with units in which representative examples occur, are presented in this report.

A single limited excavation was conducted. It consisted of removing the fill from a 5-foot long section of the ground sluice running north on the east side of Unit 8 (Map 1). The purpose of this work was to determine the depth of the feature, to expose and record the retaining walls forming its sides, and to see if any evidence of gold recovery devices remained. Two buckets of gravel from the bottom of this excavation were panned; several small flakes of gold were recovered.

A total of 43 trees in different units of the site was cored with an increment borer by Joe Molter, a forester with the Bureau of Land Management, with the assistance of Eric Ritter, Bureau of Land Management archeologist. The purpose of this work was to determine ring count, and thus the approximate age of the trees. This was done in order to estimate minimum amount of time that has elapsed since different sections of the mine were abandoned. The method, results, and interpretation of this work are discussed in the Chronology section (Appendix C).

When the initial field survey was substantially complete, members of the crew met on the site with Eric Ritter and Douglas N. Denton (civil engineer with the Department of Water Resources) to discuss potential sediment disposal areas. Portions of the boundary of the recommended dispersal area were marked with flagging tape.

RESULTS

FEATURES

Brief descriptions of each major feature type encountered at the Ohio Flat Site are given below, along with project units in which examples occur. The feature types are organized to reflect the organization of the placer mining process: supplying water with which to work the gravels; excavation and removal of gold-bearing sediments; recovery of gold; return of water and debris to the river channel; and the ultimate abandonment of the mine.

WATER DELIVERY SYSTEM

Drainage System Areas (Units 1-20)

Initial survey of the site indicated that it was composed of discrete subareas, most of which were drained to the river by separate networks of ditches and larger channels. It stands to reason that these areas must also have been mined as separate entities, as placer mining depends on flowing water and gravity for gold recovery. Thus, these drainage system areas were the primary units in which the industrial features of the site were recorded.

Drainage Divide

The boundaries between the drainage system areas were defined in several ways. In some areas, substantial ridges of boulders divide one system of drainage channels from another (e.g., west side of Unit 10). In other instances, the divides between areas are more gradual, marked only by the end of one series of ditches and a gradual change in grade (e.g., south side of Unit 10).

Different kinds of features are related to the process of loosening and removing unmined sediment for the recovery of the placer gold it contained. These features presume the presence of water provided by the delivery system features described above, and methods of channeling the water and loosened sediment through a gold recovery system and ultimately back into the Trinity River.

Boulder Piles (All Units)

The Ohio Flat mining site is, above all else, characterized by piles of cleanly washed boulders. These are the debris left by the mining operation, which resulted in the removal of the finer sediments from which the free gold was recovered. The presence of such large numbers of boulders was probably the primary engineering challenge that faced the miners working this site. If the deposits in this area had contained a higher percentage of finer sediments (i.e., silt, sand, and cobbles less than 256 mm in diameter), it would have been possible to run much of the deposit through the ground sluices and drain channels. As the boulders were too large to simply wash away (at least with the amount of water available), they had to be moved out of the way to enlarge and deepen the mine. Much of this was probably done by hand, although some are of such size that derricks or similar devices must have been used. No evidence of such machinery was encountered, however.

Retaining Walls (Units 1-20)

Probably the most common mining features in the project area besides the washed boulders themselves are uncoursed unmortared rubble retaining walls made of stacked boulders. These served several purposes. The first was to retain stones too large to be carried away through the sluices leading water and finer sediment out of the mine. In this instance, larger boulders were stacked to form relatively low walls in front of an area that had already been washed. Then, as the area being worked was expanded and cut deeper, the large cobbles and boulders washed loose were thrown behind this wall to keep the area being worked clear (e.g., Unit 10 - east side, Unit 4 - east end). These walls and the masses of stone behind them would also have the effect of channeling the stream of water to cut into the opposite bank of unwashed sediment.

Another function of boulder retaining walls was to provide a stable bank along the sides of the deep drain channels leading out of the mined areas. This was especially important as the mines (and of necessity the drain channels) grew deeper. In some areas, there are as many as four sets of retaining walls, forming a series of terraces stepping down from the higher surrounding grades into drain channels as much as 15 feet deep (e.g., Unit 10 - west drain channel).

Narrow Rock-Lined Channels (Unit 10 - east side)

A series of enigmatic stone-lined channels is present in Unit 10. These shallow channels are formed by carefully made uncoursed unmortared stone retaining walls. They are not excavated to bedrock or other hard sediment but seem to simply pass over a deep deposit of previously washed boulders. In several areas, there are deep holes between the boulders in the bottom of the channels. Thus, it does not seem that they would have served either to carry water into the mine or as ground sluices. It is possible that they were fitted with wooden flumes, although it is hard to imagine why the miners would have gone to this effort when water-delivery flumes could have simply been placed on top of the boulders, rather than in specially prepared channels.

Undrained Basins and Pits (Units 10 and 19)

Features that are also difficult to explain are depressions of a wide range of sizes and depths which have no apparent drains. In these instances, it would have been necessary to transport the gold-bearing sediment out of the hole in order to dump it into a sluice, which would have entailed considerably more work than simply letting gravity wash it away. Perhaps some of these were test pits dug to sample the gravels below. In other instances, the drains from these features may have been obscured by later mining efforts which resulted in the filling of older workings with boulders. Much of the western part of Unit 10 is in fact a basin lower than the mouth of the drain channel leading to the river.

Footpath, Ramps (Unit 9)

Trails are visible in several areas of the site. In most sections, these are simply areas cleared of boulders. Others cross drainages on top of features identified as "earth-filled dams" (e.g., Unit 18, see below). Trails would have been required to give the miners access to areas being worked and to permit transport of sediment to sluices from mined areas that could not be drained directly. Most trails are fragmentary, and there is no apparent network through the mining area for easy access.

"Mined Pockets" (Units 5, 8, and 12)

While most of the mined areas consist of broad channels or basins, in other areas only small, winding channels or pockets were excavated into the gold-bearing deposits. In many instances, these features are situated on relatively high ground believed to represent remnants of the earlier mining surfaces. It is possible that these were simply exploratory diggings abandoned when the gravels encountered proved to be unprofitable. Another possibility is that these represent earlier, small-scale mining efforts undertaken before a commitment of capital and labor adequate to permit

large-scale mining became available. In several other areas (e.g., Unit 8 - just south of tree no. 4, Unit 16), "jogs" have been cut into the walls of major channels. In these instances, the retaining wall on one side of the channel has been removed and the bank excavated, with the debris from the cut stacked in the original channel. The net result of this was to divert the drainage in a sharp bend. Presumably, the purpose of this work was to mine a particularly rich pocket of gravel.

<u>Boulder Dams</u>

Although the site is covered with piles of stacked boulders that apparently represent debris of the placer mining process, in some cases these seem to have been intentionally placed to close channels or divert water in desired directions. These dams range in size from small heaps a few feet long across small watercourses to huge ridges forming divides between separate mining drainages. It is often difficult to tell whether the rocks were intentionally placed, or are debris moved as short a distance as possible to permit mining of adjacent ground and simply represent the point at which a particular operation was abandoned.

<u>Earth-Filled Dams</u> (Units 8 and 18)

At least two well-made, earth-filled dams across drain channels were recorded during the survey. In both cases, they are composed of two roughly parallel stone retaining walls, with earth fill between. The smallest of the two is located in Unit 8, along the eastern drain channel. It is a curved structure about 10 feet long and 2 feet high, one end of which seems to have been washed away. It appears to have been placed to divert the flow of water down this channel into another that curves to the northwest towards the river. The second is located along the western channel of Unit 18, which originates on the south side of the Unit 21 ridge. It is considerably higher than the first, rising about 6 feet above the bottom of the channel. A trail presently leads across it. Water has impounded behind this dam in recent years, although a drain channel has been dug around the north end to partially drain the pond thus formed. The original reason for building the dam is unclear; it could have been constructed to impound water or simply to provide a pathway across this deep channel.

<u>Primary Water Supply Ditch</u> (Unit 22)

It appears that most of the mined portions of the project area were supplied with water from a single ditch. Historic sources suggest that this was the George Frederick Ditch, which originated on Grass Valley Creek (see Historical Background). Water was probably conveyed from various points along this ditch by secondary distribution ditches, flumes, and/or iron pipe to the areas being mined.

<u>Secondary Water Distribution Ditch</u> (Units 21 and 22)

When terrain permitted, water was probably carried by smaller ditches from the primary water supply ditch to the areas to be worked. The ditch that ran along the ridge at the east end of Unit 21 is the best surviving example of a secondary channel. It is not clear how water was carried to this ridge after

the mining of Unit 20. Sections of this ditch are lined with stone. Other small ditches in Unit 22 probably were used to carry water from the main ditch to the areas where it was needed.

Water Delivery Flume (Units 1 and 9)

Wooden flumes were probably the key features in the water distribution network. Very little evidence of them remains. These would have been temporary structures that were moved across the site as work progressed. The only direct evidence of a flume is the badly decayed fragments of milled lumber containing cut nails in the bottom of the Unit 1 channel. This is presumed to represent a flume that carried water from the secondary distribution ditch on the ridge in Unit 21, to Unit 9, across the Unit 1 drainage.

Flume Supports (Units 1, 9, and 22)

Several large conical piles of stones are present at the north end of the projected flume location described above. These are believed to have supported wooden uprights that carried an elevated flume. Other conical piles of stones in various areas of the site may have carried flumes as well, although no additional evidence of the flumes themselves remains in other areas with which to confirm this assumption. These differ from tailings piles in that they are more regularly shaped and occur in alignments. In several units, there are long narrow stacks of stones that may have supported flumes. The best remaining examples of these are located in Unit 22, where secondary distribution ditches apparently ran off the main ditch to supply water to Unit 18. Flumes would have been required here to carry water from the ditches across the existing meadow to the mined area.

Water Delivery Pipe (Units 15 and 19)

Like wooden flumes, riveted iron pipe could have been moved around the site to deliver water with relative ease. Evidence of pipe was found on the site. The pipe's value could have caused its removal from the area when mining ceased (Appendices C and D). A single fragment of riveted sheet iron was noted in the project site, in Unit 19 (Appendices C and D).

Rust Stain (Unit 15)

A long, oxidized stain on the surface of the exposed boulders was noted in Unit 15. Although it was hypothesized that this might be attributable to the use of a leaking iron pipe, an alternative explanation is that a fallen tree burned in place, or a wooden flume leaked.

Wooden Footbridge (Unit 17)

The only wooden structure noted in the project area besides the flume remains in Unit 1 is composed of several pieces of milled lumber placed across the north end of the westernmost drainage in Unit 17. Although the function of this feature is not apparent, it seems to be of recent construction; it is made with wire nails and the wood is in a good state of preservation.

GOLD RECOVERY FEATURES

Once the fine sediment had been freed and large cobbles and boulders removed, it was passed through one of several simple mechanisms in which the gold was separated from sand and gravel. Gold, being much heavier than the other minerals present, would quickly settle from the water and lighter materials, lodging in any crack, crevice, or low spot present.

Flumes

The bottoms of wooden flumes were frequently fitted with riffles of wood or other materials, behind which the placer gold would lodge and thus be prevented from washing away with the rest of the sediment. Remnants of only a single flume have been recorded (Unit 1). There is no way to determine whether this feature was equipped with riffles or was simply used to move water and/or sediment across the site.

Flume Tailings Pile (Units 9 and 15)

One pile of fine sediment was recorded in Unit 9, near the projected outfall of the flume mentioned above, and two others in Unit 15 adjacent to sluices. The reason for the presence of these piles is not clear; perhaps the flume and sluices were used for gold recovery, with the debris simply washing out the end in this area.

Ground Sluices (Units 6 and 8)

Ground sluices appear to have been the primary mechanisms used for recovery of placer gold in the project area. Ground sluices may consist simply of ditches dug to bedrock or other hard deposit, or may have wooden sides and bottoms. They are fitted with riffles or comparable devices (e.g., cobbles or blocks of wood) among which the particles of gold settle and are trapped. The best examples in the project area are situated in the south end of Unit 6 and the east side of Unit 8. In both instances, they are narrow (1.5 to 2 feet wide) ditches with carefully made stone retaining walls on each side. A 5-foot section of the Unit 8 ground sluice was excavated, revealing an almost flat clay bottom at a depth of ca. 2 feet below the top of the retaining walls. No direct evidence of the presence of a wooden liner or the type of riffles used was encountered in this excavation. The grade of the ground sluices is gentle (about 2 feet per 100 feet of length), which probably maximized gold recovery.

Ground sluices or comparable features must have been located along the drains out of each of the separate mining areas of the site, although none are preserved. In some cases, they may be covered with talus that has eroded into the channels since the mine was abandoned. In others, the recovery sluices may have been destroyed during the final cleanup operations to recover gold trapped in them.

Feature Description (Unit 8)

In Unit 8, a single feature was excavated which appeared to be a ground sluice ditch. A small unit was placed in this feature to determine its depth and whether or not wood was used to line the ditch, and to discover any evidence

of the function of this feature. This unmortared, native stone-lined ditch was about 18 inches wide and slightly over 2 feet deep. Most of the rocks used to line the ditch are boulder size, with walls three stones deep. Soil of the ditch floor consisted of rock and sandy clay soil.

The bed of the ditch may have been lined with flat cobble-size stones possibly used to form riffles on the ditch floor to trap the gold. Subsequently, the trapped gold and sediment would have been dug out and panned. There is a large quantity of water-worn flat cobbles next to the ditch. Samples from the bottom of this ditch were panned and traces of placer gold were recovered.

<u>Drain Channel</u> (Units 1-20)

Drain channels are the generally deep ditches through which water exited the mined areas; each major drainage area was serviced by at least one major drain channel. In most instances, these are deeper (up to 15 feet) than the network of channels running through the interior areas of the mine and are often flanked by several terraces supported by massive boulder retaining walls. The slope of these channels is also generally greater than that of the interior ditches and ground sluices and increases as they approach their mouth. The ground sluices described above enter the mouths of their respective drain channels, although they do not seem to have extended to their full length. These drain ditches exit through a bluff into the main river channel where the tailings were washed downstream during the winter floods. No mining debris survives at their mouths today.

UNIDENTIFIED FEATURES

<u>Stacked Rock Enclosures</u> (Units 17 and 18)

At least four round and rectangular enclosures of stacked boulders were recorded in Units 17 and 18 in the eastern end of the site. Their functions are unknown. Although the possibility exists that these might represent building sites, tent pads, hearths, or dwelling-related structures, no domestic artifacts were observed in these areas.

<u>Leveled Areas</u>

Leveled areas on the ridges between mined channels were noted in Unit 18; it is not clear whether these were intentionally flattened.

UNMINED DEPOSITS (Units 12, 14, and 19)

In addition to the ridge that forms Unit 21, a number of banks and promontories of unwashed, seemingly undisturbed natural deposits were observed in other areas of the site (e.g., hillocks higher than the 1,780-foot contour in areas cited). These appear to have been intentionally left <u>in situ</u>, in that the surrounding grades have been lowered through mining. Although we located no clear evidence as to the reasons that these remnants of the original deposits were left intact, it is possible that they supported flumes carrying water across the mine or were the sites of derricks or other machinery needed to move large boulders. The trees on some of these promontories might be cored to determine if they are significantly older than those growing in the abandoned ditches.

POST-ABANDONMENT FOREST GROWTH

The placer mining effort destroyed most of the vegetation on the site. Once mining efforts in any drainage area ceased, the native plant community began to reestablish itself. Although it is not clear how much time passed before trees started to grow in the denuded areas, it stands to reason that most if not all of the trees presently growing on the site postdate the abandonment of the mine. Since pines and other trees growing here add an annual growth ring, counting the rings provides a method of estimating the date of cessation of mining efforts. Further, by comparing the ages of trees in different areas, it was possible to at least tentatively identify the sequence in which these different areas were mined. There are, of course, a number of factors that complicate this process (see Chronology section). The relative dates of abandonment of a number of different areas suggested by the tree-ring count tend to reflect the sequences suggested by topography and superposition.

ARTIFACTS

A number of artifacts were observed in the mined area. Although mostly bits and pieces of metal artifacts, some milled lumber and split post fragments were also noted. All lumber fragments were examined and none contained hardware except square cut nails as noted on page 17. Lumber dimensions were difficult to determine due to fragmentation. Most of the pieces observed appeared to be 4" x 4" or larger milled or split post fragments and 2" x 4" or larger planks of unknown length. There is no way to determine the original use of any of these fragments. A number of metal artifacts were noted and nine examples were collected for analysis. Artifacts noted but not collected include a portion of a riveted boiler plate tank (see Appendix D), numerous pieces of iron or steel strap, and rusted cut nails.

All metal artifacts collected are curated at the State Department of Parks and Recreation Archeology Laboratory under Accession Number P-611.

Metal artifacts collected include a fragment of iron pipe with cut nail rivets (#1) (Appendices C and D), a round overlap seamed tin can converted for use as a pouring device (#2), a rectangular (possibly one gallon) can converted for use as a bucket by the addition of a wire bale (#3), a fragment of iron or steel strap or plate (#4), a corner of a possible iron grizzly plate originally attached with cut nails (#5), most of a possible rocker or cradle riffle plate of iron sheet (#6), a brass opium tin with lid (#7), most of a flattened tin one-gallon can with double overlap seams (#8), and a large tin flat seamed box thought to be a shipping container (#9). For dimensions, drawings, and photographs of these artifacts please see Appendices C and D.

DISCUSSION

COMPARATIVE TECHNOLOGY

Any comparison of archeologically or historically identified mining sites must be prefaced with a short explanation of gold mining technology. During California's early gold mining period, most mining was shallow placering adjacent to streams and rivers. In most areas shallow placering was replaced with deep placering or lode mining (see Appendix A). Although shallow placering was rapidly abandoned in some areas, in others the techniques are still in use today.

Shallow placering consists of the removal and processing of loose surface soils and gold bearing sand and gravels. This was conducted with an increasingly complex and more efficient technology. The simplest and earliest technique is "panning" with a metal pan or wooden batea. The pan was characteristically seamless and spun or stamped from a single sheet of steel. The batea is a conical wooden bowl often painted black on the inside to highlight the gold flakes. The batea was the favored device of Latin Americans and is still used throughout Latin America today. The pan and batea were rapidly replaced with more efficient higher volume devices and generally relegated to testing of new potential sites.

The device which generally replaced the pan was the rocker or "miners cradle." The rocker looks very much like an early 19th century rocking baby cradle. It is built of wood and ranges in size from 24-60" long, 12-24" wide, and 6-24" high. Gravel is placed in the rocker and washed through with a small amount of water. The rocker is the most water conservative of the large scale placering tools. The larger gravels are caught on a screen or punched iron sheet while smaller material falls through to the bottom. In the bottom of the rocker is a rough surface designed to hold the heavy gold particles. This surface can be anything from a metal screen to a piece of wool blanket. After the debris is worked out the low end of the rocker the gold is removed from the rough surface. One or two men can process from three to five cubic yards of material per day through a rocker.

The third generation of placering tools is called a "Long Tom." The long tom is an inclined trough usually built in two sections, the sluice and the riffle. The entire construction is generally about twelve feet long with a one-foot drop (1" drop to the foot). This device is narrow at the top with the bottom width about double that of the top. The upper portion is a sluice with screen or perforated metal sheets designed to remove larger material while the smaller material is washed down into the lower portion or riffle box. The riffle box contains riffles or stops behind which the heavy gold is trapped while lighter material washes out the bottom end. Two to four men can process six to ten yards of material through a long tom per work day. It also needed a steady stream of water entering the head of the box.

The fourth generation of gold retrieving devices is the sluice. In most ways a sluice is simply a very large long tom. Sluices are either built above ground as flumes or as trenches cut into bedrock or some combination of the two. Sluices are large volume devices operated with little or no sorting. Very large rocks are often removed by a sluice tender. In most cases material is fed into a sluice through some sort of low or high pressure hydraulic action. The principle advantage of a sluice over a long tom is length. The longer sluice allows more gold bearing material to settle out. The bottom of a sluice is roughened in a variety of ways to facilitate the holding of gold. The roughening varies with type of sluice. Screens, perforated metal sheets, or wooden pole or slat riffles are common in flume sluices while rock layers or block riffles are more common in ground sluices. It is common to build a wooden sluice onto the bottom end of a ground sluice to enhance gold retrieval. Large scale sluicing became popular with the advent of high volume processing techniques such as booming or hydraulicking.

Undercurrents were often used with flumes and ditches to catch the small and heavy sands for sluicing. Heavy perforated steel plates or iron rods (called grizzlys) were placed into the bottom of a flume or ditch and the undercurrent placed below. As rock and gold bearing sand was washed down the ditch, the smaller material would fall through the the undercurrent while the larger rock washed past in the flume or ditch.

Booming is a method which entails the dumping of the entire contents of a small reservoir at once. This creates a rapid high volume, short-term movement of material. Booming had a short-lived popularity because it was a very wasteful system with much of the gold carried through the sluice by the high volume of water. Booming was replaced, where feasible, by hydraulicking. Sometimes a "self shooter" was used which was an automatic tripping device so that water saved behind a dam was released all at once when the reservoir filled.

Hydraulic mining was dependent on a regular water supply system capable of delivering considerable volume at high pressure. This technique used hose and nozzle systems ranging in size from modern garden hoses to huge monitors capable of moving hundreds of yards of material per day.

Hydraulic mining was the principal deep placering technique of the third quarter of the 19th century. The water supply needs associated with this technique resulted in the formation of large mining and water supply companies to develop and manage the elaborate supply systems necessary to make this system cost effective. After hydraulic mining, throughout most of California, was outlawed in 1882 many of the mining companies returned to lower volume water operated systems.

In addition to the placering of riverside benches and fossil river channels, it was also common to divert and drain all or part of a section of stream or river channel so as to expose the auriferous sands and gravels in the bed. Although partial damming of streams and rivers was known and practiced in the 1850s the extensive use of such techniques is generally attributed to Chinese mining companies from the 1860s to as late as the 1930s. Wing damming is the principal method for diverting flow from a section of stream or river bottom. Wing damming was begun by building a rock wall out into the current above the area to be investigated. A second parallel wall was generally constructed about five feet downstream from the first. The space between the walls was filled with finer material with sand against the two walls and heavier gravel in the center. This process was continued until a section of bottom was completely encircled. After the completion of the dam an undershot water wheel was constructed near the downstream end. The water wheel shaft was connected to a "Chinese pump" and the water inside the walls pumped out. A Chinese pump consisted of two rollers which had mounted between them a belt with rubber or wood flaps to lift out the water.

Once the bottom gravels are exposed they are usually removed by shovel and barrow and transported to a long tom or sluice for processing. Although this technique could yield considerable gold, there are numerous instances where no gold was found in the exposed materials. Many associate this technique most closely with the Chinese because of the labor intensive needs. Except for the water wheel and pump, usually moved from site to site, this technique was only costly in terms of the labor involved. In most cases, all work had to be completed in one season due to destruction of the workings by winter floods.

Ohio Flat Mining Techniques

Features recorded during the "Ohio Flat" survey include primary and secondary water supply ditches, flumes, and pipes; boulder piles; retaining or channeling walls; rock lined channels; rock and earth dams; drain channels; possible derrick foundations; and flumes and ground sluices. If the Trinity River was dammed opposite the Ohio Flat frontage, no evidence remains.

The area of Ohio Flat was mined in a series of stages between the 1850s and about the turn of the century.

The first Chinese claim to Ohio Flat was registered to the She Lim Company in 1860 and the area was worked principally by Chinese until at least 1885.

A Comparison: Ohio Flat and Other Sites

Ohio FLat has been identified, through claim records, as a Chinese mining site. Although Chinese mining sites in California and elsewhere have been noted by many as identifiable from their elaborate stone walls and clean appearance, the data base does not support such assumptions.

The jumble of superimposed stone features at Ohio Flat probably shows the use of several water transport and material processing systems. The complex and jumbled nature of the Ohio Flat site does not support assumptions about the industrious and cleanly Chinese.

A review of several known or suspected Chinese mining sites in California, Oregon, and New Zealand also brings assumptions about Chinese mining techniques into question. Research by Doreen Askin (Clement) and Robert Docken on the "Natoma Station Ground Sluices" on the south side of the Lower American River below the town of Folsom revealed no special techniques or attributes associated with this mining area (1980:1-60). The area is believed by locals to have been mined by Chinese (Askin and Docken 1980:46).

In his thesis "Sojourners in the Oregon Siskiyous" Jeffery LaLande determined that there were no Chinese specific attributes associated with known Chinese placer claims in southern Oregon (1981:333). LaLande's extensive research showed that Chinese used the same tools and generally the same techniques as Euro-American miners. He did note that Chinese operations had a tendency to be more labor intensive. LaLande further notes that there are photographs of placer mining in southwestern Oregon showing Euro-American miners working among the type of elaborate uncoursed unmortared rubble walls which are generally attributed to Chinese (1981:332). An examination of shallow placering in the Central Otago Mining District of New Zealand shows both Chinese and European sites with neatly stacked walls (Ritchie 1981:55). Based on claim records Ritchie also identifies debris covered sites with both European and Chinese mining (1981:55). Several extensive mining areas in Shasta County have recently been archeologically surveyed in preparation for proposed reservoir construction. Again, as with the studies noted above, none of the widespread mining activities recorded could be positively identified as Chinese except through mining claims and analysis of associated residential sites (Johnson and Theodoratus 1984).

Analysis of specific mining sites being inconclusive, the principal methods for identifying Chinese mining sites lie in claim and census records and the remains of Chinese residential complexes. Chinese residential areas could be several miles from the mining sites. The closest known Chinese habitation area to the Ohio Flat claim is Lewiston. Lewiston is on the Trinity River about four miles east of Ohio Flat and it is probable that most, if not all, of the members of the She Lim Company lived there.

CHRONOLOGY

The Ohio Flat tailing site cannot be precisely dated due to a lack of specific dates in the recorded history of the Lowden Ranch Mining District. Data available suggests that the Frye brothers who emigrated from Germany in 1848 arrived in Weaverville in 1852 and began mining in the Lowden Ranch Mining District. However, since the site is only a few miles east of the original gold discovery on the Trinity River, it can be assumed that this area was prospected very early.

Lowden had already settled on Grass Valley Creek in 1851. Between 1851 and 1852, the "Old Skinner Ditch," Frederick Ditch, and Ranch Ditch were built. These early ditches would have facilitated placer mining activities in this mining district by the Frey brothers, as well as other reported German miners in the area. Chinese entered Trinity County in 1851 and began placer mining along the Trinity River. By 1856, they were found throughout the river canyon. Although they are mentioned as mining the Trinity River placers in the 1850s, their presence in our study area is officially noted in a claim filed in the Ohio Flat area by She Lim on November 10, 1860 (Brott, et al.:1982). The increasing number of Chinese during the 1860s used ditches and flumes in a labor-intensive approach to ground sluicing which made placering a lucrative operation. Mining continued to be carried out by the Chinese into the 1890s and, although Euro-Americans had generally lost interest in this type of mining, they were still to be found in the Lowden Ranch Mining District with their Oriental counterparts.

Mining interests in the Ohio Flat area continued into the twentieth century as evidenced in mining claims listed during this period.

In order to define a chronological network of mining periods and attempt an internal sequence of mining operations, a series of tree ring dates were secured for this site. The placer mining effort destroyed most of the vegetation on the site. However, once mining efforts in any drainage area ceased, the native plant community began to reestablish itself. Although it is not clear how much time passed before trees started to grow in the denuded areas, it stands to reason that most if not all of the trees presently growing on the site postdate the abandonment of mining. Most trees add an annual growth ring of wood. Counting the rings of trees present in mined areas provides a method of estimating the date of cessation of mining efforts. Further, by comparing the ages of the largest trees growing in the mining features, it was possible to at least tentatively identify the sequence in which these different areas were mined. There are, of course, a number of factors that complicate this process, although the relative dates of abandonment of a number of different areas suggested by the tree ring count reflect the sequences suggested by topography and superposition. The previously noted site complexity is another major factor.

Eric Ritter, BLM Archeologist, and Joe Molter, BLM Forester, under the direction of Norm Wilson, DPR Archeologist III, carried out tree coring and dating for 43 trees. Thirty-three (33) ponderosa pine, nine Douglas fir, and one alder tree were selected in mining features such as ditches and side walls of sluices or flumes. A large oak was unsuccessfully augured due to hardness.

All trees were measured at 4-1/2 feet above ground level. Seven years of growth was added to each ring count to allow for growth to that height. (This is a standard forestry technique used to establish age.)

This exercise was carried out in an effort to develop an internal relative chronology for this site. Specific questions were:

1. What is the overall time period for operation of the mining site?

2. What, if any, internal sequences of use could be drawn from tree ring cores taken from trees scattered over the site?

3. What features or mining techniques could be dated relative to the chronologies developed for mining areas?

Tree rings were counted in order to get an age for each tree. These were inferred to indicate the time at which soils were undisturbed long enough for successful germination and growth to develop, thus suggesting a rough date for the end of mining in each area. Trees were avoided which grew in seemingly undisturbed areas or trees which may have been growing during the mining process, such as on small soil islands seemingly undisturbed by mining or used during the mining operation. These selective criteria were used to avoid skewing the sample. It was noted that the largest trees were not necessarily the oldest due to varying conditions for growth. Most trees were selected both by size and location, with the location being the primary reason for selection.

Tree ring dating is not an absolute dating technique and the dates presented in this section are a best guess based on standard correlations.

<u>1860 to 1881</u>

The earliest dates showing a cessation of mining between 1860 and 1881 come from a compartment formed by Units 6, 7, 8, 11, 12, 13, 14, 15, and 19. These areas form the northern tip of a tailing site on an apex of a bend in the Trinity River. Unit 19 lies generally in the center of the site. Unit 10 forms a later intrusive mining operation.

The compartment comprised of Units 6, 7, 8, 11, 12, 13, 14, 15, and 19 seems to represent a part of the earliest mining activity on Ohio Flat. Early tree ring dates for these areas fall between 1860 and 1881. Units 6 and 8 seem to be connected to a ditch and flume system which received water from Unit 21. A large channel in Unit 11, tree ring dated at 1874, may at one time have been connected to this flume.

Unit 7 lies between Units 6 and 8. Tree ring dates place mining in this area before 1869. No flumes or ditches were recorded entering this area or connecting with the two observed channels on the southwest and northwest aspects. Although no clear connection now exists between Units 6 and 8 with Unit 7, they may have been connected via a common flume or ditch system.

Although Unit 11 has already been discussed as associated with Units 6 and 8 through a common flume and ditch system, it may also constitute a part of the area of the northeast aspect facing the Trinity River. This aspect subsumes Units 11, 12, 13, 14, and 15 into one unit abandoned before 1868 in Unit 13 to 1881 in Unit 12. These areas are not contiguous but have been separated by a possible later intrusive mining operation dated prior to 1892 consisting of two long drainage channels trending northeast from Unit 10.

The intrusive mining of Unit 10 has obscured remnant ditches or flumes which would show the connections of these areas with each other, as well as the original water system connecting them with the ditch remnant in Unit 22 and the possible raised flume in Unit 1.

1882 to 1900

Units 16, 17, and 18 form the eastern segment of this site. Units 1 and 21 form linear connectors from the southwest to a point at which Units 16, 17, and 18 roughly converge on their southwestern ends. Unit 10 lies roughly in the center of the site and represents a later intrusive mining operation in an area dated as abandoned after 1892.

These units are seen as a collective group based upon the clustering of dates in the 1890s, as well as their probable interconnection with a ditch distribution system in Units 1, 21, and 22. These ditches may have served as a distribution channel for waters flumed over from the main ditch in Unit 22. Unit 17 is undated and may not be contemporaneous with these units.

Contemporaneous with the above mining areas are Units 3 and 5, which have been dated as abandoned by 1891 and 1889, respectively. These units may at one time have been a part of the same mining operation but have been intruded into by the later mining of Unit 4.

Post 1900

Units 2, 4, 9, and 20 have been tree ring dated at abandonment before 1903 to 1910. These appear to represent the final stage of mining of Ohio Flat. Units 2, 4, and 9 may have been mined in several phases of a single operation. Unit 2, dated at abandonment by 1903, may be followed by Unit 4 dated 1905. However, the occurrence of tree germination is variable and the closeness of these dates is not great enough to rely upon for such a distinction.

Unit 20, dated at abandonment before 1904, may represent the region of the site into which water was received from the main supply ditch in Unit 22, as well as a secondary ditch which appears to have supplied water to Unit 18 as well as Unit 20. Two small ditches in Unit 21 seem to have also supplied water to this unit. One large drain was noted at the upper edge of a cut bank overlooking Unit 20 from the south. This unit lies outside of the project area; however, it should be mentioned that this drain may have brought water from an unknown ditch serving the upper ridge to Unit 20.

The Ohio Flat mining area has been the focus of mining interests for emigrant cultural groups, including Germans and Chinese, from the 1850s to about 1910. Chronologically, this site appears to have been mined in a general series of

operations. Initial ground sluicing seems to have begun at the north central bend in the river prior to 1860 and been completed by 1881. Units dated in order of abandonment consist of: 8, 13, 7, 14, 19, 11, 15, 6, and 12.

Mining activity after 1881 seems to have been concentrated in the south and southeastern aspects, as well as two units in the northwest and the central portion of the site as represented by the intrusive mining of Unit 10. Units dated in order of abandonment for this area include: 1, 3, 5, 10, 16, 18, 21, and 22.

A final period of mining appears to fall between 1903 and 1910 for units in the south and west aspects of the site. These, in order of abandonment, are: 2, 4, 9, and 2.

It is not possible at this time to define sequences of operation within each of these units, due to the obscuring and destruction of many features by reworking of some areas and the destructive intrusion of mining operations in other areas. A much more intensive tree dating survey would permit the dating of all features within the site.

It would appear that mining began with shallow surface sluicing on the bench near the river, perhaps with surface ditches or flumes. Later mining began to go deeper into the bench gravels. This would require greater labor forces, and increased development of drains, flumes, and water supplies. Since typically gold deposits are richest in these gravels at bedrock, the claims must have produced enough return to encourage a major mining effort during the later nineteenth century across the entire bench to reach these buried gravels and their golden return. It is interesting to note, however, that there are no bedrock exposures in the site with the exception of Unit 16 near the river. It is unknown if the mining reached bedrock and its supposed richer gravels. It may have been too large a task to lower the drain ditches to wash the lowest deposits.

SITE SIGNIFICANCE

One of the purposes of this study was to assess the significance of the Lowden Ranch/Ohio Flat Mining District in terms of the National Register of Historic Places criteria. These criteria are stated as follows:

> "The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history."

The National Register significance criteria require that the historical importance of a site as well as its present condition be considered in making historic significance determinations. A cultural resource is considered to be significant in National Register terms if it is both historically important <u>AND</u> possesses integrity (i.e., "an unimpaired or unmarred condition: entire correspondence with an original condition"). Conversely, a resource is <u>NOT</u> National Register eligible if it is not historically important <u>OR</u> is important but lacks integrity. Thus, to argue that a site is worth preserving, it is essential to demonstrate that the resources in question are both important and relatively intact.

There is no question that the integrity of some units of the current project site have been compromised. Examples include the west end of Unit 20 (fill, corral and stable constructed), the central sections of Units 6, 7, and 19 (power line road), and the east end of Unit 2 (1983 DWR sediment disposal site). Many of the others, however, appear to be almost totally unmodified since their abandonment almost 100 years ago. The integrity of each area is discussed in the description section of the report.

The question of historical importance is more difficult to address than that of integrity in assessment of National Register significance. Assertions of historical importance are subjective. Nevertheless, some historical themes and events are so widely accepted as important that little argument is required to establish the sites and structures associated with them are

historically significant. This is true of California's Gold Rush and the subsequent evolution of the gold mining industry of the State. There is little doubt that the site in question is ". . .associated with events that have made a significant contribution to the broad patterns of our history" (Criterion a).

It is argued that the attribution of the site to Chinese miners constitutes significance in terms of Criterion b, that it is ". . .associated with the lives of persons significant in our past." While the Chinese were certainly not universally admired by nineteenth century Californians, historical research continually expands our understanding of the depth of their involvement in the development of many of the state's leading industries, including gold mining. By the 1870s, they constituted the greater percentage of all the miners working in the state. In spite of this, they are only poorly represented in the surviving English-language record of that period. In light of this, careful preservation of the remaining cultural resources representing the Chinese contribution to California's industrial heritage becomes even more significant.

The Lowden Ranch/Ohio Flat Mining District is most likely typical of many of the labor-intensive placer mining operations that characterized the initial development of California's gold mining industry. During later phases of development, well-capitalized corporations using high-production techniques such as hydraulic "giants" and dredges largely replaced the small, more labor-intensive operations. In the process of subsequent mining, as well as other twentieth century construction and development, much of the physical evidence of the early placer mining operations has been destroyed. In this regard, the project site has become an important resource, one of relatively few surviving examples of features ". . .that embody the distinctive characteristics of a type, period, or method of construction. . .or that represent a significant and distinguishable entity whose components may lack individual distinction" (Criterion c).

While the current project has begun to document and interpret the cultural resources present on the Lowden Ranch/Ohio Flat Mining District site, much work remains before a complete understanding of the mining operations represented there is attained. The historic features have only been recorded in terms of their general details. In light of this, it is clear that the site has ". . .yielded, or may be likely to yield, information important in. . .history" (Criterion d), if subjected to a more thorough recording and analysis. Further, it is felt that the site possesses a public information potential that could be realized through active interpretation of selected features. The sheer size and simple elegance of some of the features, and the amount of labor represented by the site as a whole, are impressive pieces of "information" when viewed firsthand that no method of recording or describing can adequately convey.

RECOMMENDATIONS

The continued use of this site for the deposition of river sediments will effectively dilute the significance of this site to the public but also the research interests of historians, geographers, and archeologists. The preferred result of this study would be the selection of a nondestructive alternative site. However, if this should be impossible, the following recommendations are made for the preservation of diagnostic and interpretive features of this site.

For a discussion of the units noted below, please see Appendix B.

Unit 1

Key aspects of the water distribution system in the form of flume supports are found in the eastern third of this unit. Additionally found were drainage systems, boulder piles, mine excavation features, and retaining walls. The latter features form a background from which the flume supports may be interpreted. Preserve the eastern and western thirds and permit dumping in the central one-third.

Unit 2

The central portion of this unit was used for sediment disposal in 1983. These gravels have obscured features. No continued dumping should take place in the eastern half of this unit.

Unit 3

This small unit contains three large channels in a relatively high embankment. Although it has been cut through by a haul road, its interpretive value would be completely lost if dumping is continued. Dumping is not recommended here.

Unit 4

This unit contains large retaining walls and deep cuts to hold mining debris; as such, it is a contrast with many other areas which are much shallower. Although sediments have been deposited in the adjoining Unit 2, features of this unit seem to warrant preservation. Deposition is not recommended here.

Unit 5

This unit merits preservation because of its higher, possibly older mining surface and relationship to features in adjoining drainages.

Unit 6

Although a utility corridor runs through this unit and impacts a well developed ground sluice, sufficient portions remain to link this with channels in other areas. This may provide a significant aspect of interpretive history programs. Dumping is not recommended here.

Unit 7

This unit contains one of the earlier elevated mining surfaces. It is surrounded by significant features in other units and merits protection. This is not a recommended disposal site.

Unit 8

This unit contains one of the more complex, undisturbed, and interesting areas of the site. Its potential for understanding the history of this site and value as an interpretive display bars its use as a disposal site.

Unit 9

This unit contains significant features related to mining, as well as fluming systems on its southern one-third. Deposition is not recommended in this area; however, deposition in the northern two-thirds would be permissible.

Unit 10

The unique and well defined features of this unit provide valuable data on the mining processes of this site, as well as high potential for interpretive programs. Preserve this site from dumping operations.

Unit 11

This feature and its potential for contributions to interpretive programs make this unit a good candidate for historic interpretation and further research. Deposition is not recommended.

Unit 12

The features in this unit have potential for further historic interpretation. A loss would occur if silt were deposited on this site.

Unit 13

The features and interpretation potential of this unit argue in favor of not using this unit as a dump site.

Unit 14

This unit contains significant features which are related to the mining of the original surfaces. Dumping is not recommended in this area.

Unit 15

A lack of well defined drainage systems and related mining features make this unit a good candidate for dumping.

Unit 16

This unit lacks any well defined features and would make a good candidate for dumping.

Unit 17

A lack of significant features and interpretive potential make this unit appropriate for disposal. However, care should be taken to protect a doughnut-shaped cobble pile located on the northeastern slope of this unit.

Unit 18

The southeast and southwest aspects of this unit contain unique and significant features of this site which would provide data on the history and techniques used by the miners. However, the central portion does not contain features which cannot be studied elsewhere. Dumping is recommended only for this central portion of the area.

Unit 19

Due to disturbances caused by the cutting of a utility road, parts of the northwestern portion of this unit seem like a good area for sediment disposal. Care should be taken to avoid the undisturbed features along the south side of Unit 10, as well as remnants of the flume which entered Unit 9's southern one-third.

Unit 20

Major aspects of this unit have been severely disturbed by private and public development. Since sediment disposal would be at the behest of private landowners, dumping is recommended in the southeastern corner of this unit. Care should be taken not to deposit aggregates on the extensive bank of stacked boulders in the north side of the east end of the unit. This may represent a flume support.

Unit 21

This unit comprises the major water distribution hub for this site. It has good potential for understanding the mining techniques used at this site. This unit would be of great value to a historic interpretive program. Sediment disposal is not recommended for this unit.

Unit 22

Almost all of Unit 22 is under private ownership. Landowners have expressed an interest in having portions of their land filled in. If at all possible, representative sections of the ditch as well as the stone structures related to fluming should be preserved.

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May 9, 1874
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January 27, 1877
July 3, 1880
July 10, 1880
April 22, 1882
April 24, 1886
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Appendix A

GLOSSARY

Appendix A

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APPENDIX A

GLOSSARY

The following glossary is specific to shallow and deep placers with a few terms from hydraulicking.

Terms are from two sources: History of the Sacramento Valley, California, by Major J. W. Wooldridge (W), and Report of the State Mineralogist, Vol. 1, published 1881, by Henry Degroot (D). Each entry will be sourced using either a W or a D.

Aggregated -- Where the component parts only adhere together, and separated by mechanical means. (D)

Alluvium -- Earthy deposits made by running streams, more especially such as are left along their banks during high water. (D)

Auriferous -- Containing gold. (D)

Bar -- A ridge of sand, gravel, or rock running across a stream or river or across the entrance to the latter; or, accumulations of gravel along the banks of a stream, and which, when worked by the miners for gold, are called "bar diggings." (D)

Batea -- A wooden bowl in which auriferous earth or pulverized ore is worked (see Pan). (D)

Bedrock -- The solid rock underlying auriferous gravel or other surface formations. (D)

Blanket Sluice -- Coarse blankets laid below the battery, over which the pulp passes. The fine gold is caught and retained in the meshes of the blankets. The latter are taken up frequently and placed in tubs of clean water, where the particles of gold are washed from them. (D)

Blue Clay -- Deposits found at the base of gravels which often yield the most placer gold.

Blue Lead -- The lower strata of auriferous gravel in the Pliocene channels of California, stained a dark blue color by discoloring agents. (D)

Booming -- In hydraulic mining the water, where scarce, is sometimes collected in a reservoir, from which, when the latter gets filled to a certain point it makes its escape by means of an automated gate. Recourse is had to "booming" where, owing to the scarcity of water, enough for washing by the hydraulic method cannot otherwise be obtained. (D)

Booming or Gouging -- This operation was supposed to be an improvement on ground sluicing, from which it differs in being a sudden rush of water from a reservoir instead of a continuous stream. This mode of mining was very wasteful. The force of the flood was so sudden and powerful that the lighter particles of gold were washed away and lost. (W)

Bowlder or Boulder -- Fragments or rock, usually understood to be large and rounded in shape. (D)

Captain -- Foreman or overseer of work at a mine. (D)

Claim -- The quantity of mining ground that one claimant or association is permitted to hold under the federal and local laws by virtue of one location and record. Sometimes termed a location, mine, etc. (D)

Concentration -- The removal of the lighter and less valuable portions of the ore by mechanical means. Concentrations are the more valuable portions of the ore so obtained. (D)

Concentrator -- The machine with which, through the aid of air, water, magnets, mechanical movement, or specific gravity, the work of concentration is effected. (D)

Color -- Fine particles of gold obtained by the "prospector" in washing a sample of auriferous gravel or crushed ore. (D)

Country Rock -- The rock traversed by or adjacent to a load or ore deposit. (D)

Coyoting -- Searching after or taking out ores in a desultory way. Making irregular holes like a coyote, a species of small California wolf. Often used term for test holes in gravel to reach the blue clay (see Pocket Mining). (D)

Miner's Cradle -- The miner's cradle or rocker somewhat resembles the old fashioned child's cradle. The machine was about four feet long and two feet wide, mounted on rockers, and inclined with the lower end open to allow the water and tailings free outlet. At the upper end there was a box, or hopper, the bottom of which was made of sheet iron, punched with holes, one-half inch in diameter. The box was movable, being so constructed that it could be easily removed and replaced. Under the hopper was placed an apron of canvas, inclining toward the head of the cradle. On the floor of the cradle there were nailed two riffle bars, about one inch high. The machine was gently rocked, and the gravel put in the hopper and water poured over it. The finer portion and the free gold passed through the holes, and being diverted by the apron, was thrown, with the water, to the extreme upper part of the floor, to flow downward and escape at the lower end of the rocking floor; the gold, with the heavy black iron sand, being held by the riffles. The gold was then collected from these riffles. (W)

Debris -- Rocky or earthy fragments or the silt, sand, and gravel that flow from the hydraulic mines; called in miners' parlance, tailings, slums, and sometimes..."slickens" (see also Tailings). (D)

Deposit -- The term mineral deposit, or ore deposit, is used to designate the natural occurrence of a useful mineral or ore sufficiently rich and extensive to warrant its being worked. (D)

Diggings -- The placer mines. (D)

Discovery -- The first finding of a mineral deposit in place upon a mining claim. (D)

Dredging -- The latest development in placer mining is the gold-dredger. The standard placer mining bucket-elevator dredge in use in California consists of a wooden hull or pontoon built in the shape of a rectangle. An opening or well through the center of the bow or forward end extends back to the middle of the hull, where a superstructure or middle gantry supports the upper end of the ladder; the lower end being supported by a cable, which passes over sheaves on the front gantry to a drum or winch, so that the ladder may be raised or lowered. A line of buckets, which excavate the gravel, is mounted on this ladder and operates through the well, rollers being fixed on the upper side of the ladder to carry the buckets. The buckets are filled with gravel at the lower end, which reaches a depth sometimes of eighty feet, and carrying the material to a height of about twenty-five feet above the deck of the dredged, dump when passing over the upper tumbler of the ladder, which is mounted at the top of the middle gantry. These buckets are in an endless chain.

The gravel from the buckets is dumped into a hopper, water jets being placed so as to direct streams of water against the sides and bottoms of the buckets, thereby freeing any adhering fine gravel and gold. From the hopper, the gravel and water pass to a revolving or shaking screen, which separates the coarse gravel from the fine, additional water from a perforated spraying pipe, extending nearly the full length of the screens, being supplied under pressure to the traveling gravel. The coarse material passes over the lower end of the screen and is stacked behind the dredge by means of a belt conveyor, the gold bearing material passes through the perforations of the screen into a distributer from which it flows over a series of riffles or gold-saving tables on which quicksilver is sprinkled, to amalgamate and save the gold; the fine gravel and sand from the gold-saving tables pass into a side or tail sluice extending well behind the dredge. The dredgers not only obtain gold, but also produce a fairly large amount of platinum. (W)

Drive -- To extend an excavation horizontally. (D)

Exploitation -- The productive working of a mine, as distinguished from exploration. (D)

Fissure Vein -- A fissure in the earth's crust filled with mineral. (D)

Float Gold or Powder Gold -- Particles of gold so small and thin they float on and are liable to be carried away by water. (D)

Flume -- A wooden race for the conveyance of water. (D)

Free -- Native; uncombined with other substances, as free gold or silver. (D)

Gang -- A set of miners. (D)

Geological Formations -- Groups of rocks of similar character and age are called formations.

Grass, Grass Roots -- The surface over a mine. (D)

Grizzly -- An iron grating that catches the larger stones passing through the sluices and throws them aside. (D)

Ground -- The rock in which a vein is found. (D)

Ground Sluicing -- Ground sluicing is another step towards hydraulic mining, larger quantities of water being used than in the other methods of placer mining, and as a consequence, more earth was moved. The plan was to bring water in a flume or ditch, to a point high enough to produce a strong current, as it flowed across the mining claim. A ditch or "ground sluice" was dug, which was sometimes terminated by a wooden sluice box with riffles. Large quantities of pay dirt were shovelled into the ditch, which was moved forward by the action of the water. When there was no bedrock, stones were thrown in, by which a bedrock was improvised. When a sufficient amount of dirt had been washed, the water was shut off, while the clean-up was made. This was done by removing the stones and washing the now concentrated earth with a rocker, long tom, or short sluice. (W)

Gulch -- A narrow mountain ravine; a small canyon. (D)

Horn Spoon -- See Miner's Pan.

Hurdy Gurdy Wheel -- A water wheel propelled by the direct impact of a stream upon its paddles. (D)

Hydraulicking -- Tearing down and washing the gold bearing gravel with water discharged upon it from iron pipes, and under great pressure. (D)

Hydraulic Mining -- Hydraulic mining as defined by the state and federal acts "is mining by the means of the application of water, under pressure, through a nozzle, against a natural bank, thus eroding the bank." This method of mining was invented in California in the early 1850s. Two places lay claim to having originated it. One is said to have employed water under pressure for washing gravel on a ravine claim at Yankee Jim's, in the spring of 1852. The water taken from a small ditch running along a hillside was carried by a flume and emptied into a barrel, set on a frame about forty feet high, where it was conducted through a rawhide hose, six inches in diameter, and discharged upon the gravel to be washed. To this hose was fitted a four inch tin tube, ending in an inch nozzle.

About the same time, a miner named Chabot, working ground at Buckeye Hill, near Nevada City, had a somewhat similar arrangement, with the exception of the nozzle.

The first rigs, after these experiments, conducted water from the ditch to the face of the gravel bank by wooden boxing and canvas hose. These were soon replaced by iron pipes which withstood considerable pressure, and after this improvement the gold obtained grew by leaps and bounds until the state became world famous for this class of mining. The scale of work reached enormous dimensions, the gravel washed by this process in 1880 being estimated as 46,025,391 cubic yards, which is equivalent to a piece of ground one mile long, one mile wide, and 15 yards deep. All this was washed into the rivers in twelve months. Such an enormous scale of hydraulic mining has never been approached in any other country.

The amount of gravels that has been washed into tributaries of the Sacramento River alone has been estimated as close to 1,295,000,000 cubic yards. Most of this was washed prior to injunctions such as the famous decision by Judge Sawyer in 1884. (W)

Method of Hydraulic Mining -- The force of the water against the hillsides loosens the dirt, gravel, etc., which are washed down and over the sluices. The sluices are from three to six feet wide, and from thirty to forty inches deep. All the gold passes through this channel and is finally distributed throughout its entire length, and must be recovered from the sluice and its branches. Some of the sluices used in California were several thousand feet long, this extension being necessary to carry the tailings to a distant dump, so as not to interfere with the mining. A long sluice also insures more perfect disintegration of the gravels, and consequently a greater yield of gold, as the more opportunities that are offered for it to settle into the irregularities in the sluice, the more gold that can be collected. An auxiliary sluice, or undercurrent, much wider than the main sluice was placed on either side of the main sluice at irregular intervals. In the undercurrent the water does not run so fast, nor is it so deep, which allows the fine gold to settle. At the point where the undercurrent is set, an iron grating is inserted on the floor of the sluice, which diverts part of the water to the undercurrent. The undercurrent is paved or riffled, and these riffles are charged with quicksilver, which catches the gold. The undercurrent is made from ten to forty feet wide, and twenty to sixty feet long. It is usually the custom to place several of these undercurrents, as some of the lighter gold flakes may have been carried by the first one. (W)

In Place -- Rock, ore, etc., occupying the position or place in which they were originally formed. (D)

Jump -- To take possession of a mining claim on the supposition that it has been forfeited or abandoned. (D)

Lode -- A fissure in the country rock filled with mineral. The terms lode, ledge, and vein are used indiscriminately. (D)

"Long Tom" -- The "long tom" quickly took the place of the rocker, and for a time seemed to be an economical, effective, and convenient method of saving gold, but it soon gave way to the sluice box. However, the method is still in use along the sandy bars of the Yuba and Feather Rivers, especially they may be seen near Oroville. The "long tom" is a rough wooden box or trough, from twelve to fourteen feet long, and about two feet wide at the upper end, widening to three feet at the lower. The bottom is covered with sheet iron, in sheets laid like shingles, the edges overlapping. The lower end is terminated by a sheet iron screen, or riddle, with punched holes like the bottom of the craddle hopper. Across the bottom of the box is nailed six or more cleats. Water is brought from a convenient stream, and received in a constant flow at the upper end. Dirt or gravel is thrown in from the sides, usually by several men. The gold accumulates behind the cleats. At the present time, quicksilver is used behind the riffles to help catch the lighter gold particles. (W)

Matrix -- The rock or earthy material containing a mineral or metallic ore. (D)

Metal -- Metal or ore. (D)

Mine -- In general, any pit or excavation made for minerals, more strictly, subterranean workings, as distinguished from quarries, placer, and hydraulic mines. (D)

Miner's Inch of Water -- The miner's inch of water does not represent a fixed and definite quantity, being measured generally by the arbitrary standard of the various ditch companies who have to sell. Generally, however, it is accepted to mean the quantity of water that will escape from an aperture one inch square through a two inch plank, with a steady flow of water standing six inches above the top of the escape aperture, the quantity so discharges amounting to 2,274 cubic feet in 24 hours. (D)

Mineral -- In miner's parlance, ore. (D)

Monitor -- A style of nozzle used in hydraulic piping. (D)

Mother Lode -- The principal vein or lode passing through a district or particular section of the country. (D)

Native -- Occurring in nature. Pure metal - as native copper, etc. (D)

Open Cut -- A surface working, open to daylight. (D)

Open Work -- A quarry or open cut. (D)

Ore -- A natural mineral compound, of which one at least of the elements is a metal. (D)

Output -- The produce of a mine. (D)

Miner's Pan -- The miner's pan was made of the best quality of Russia Iron, some of them being stamped out of a single sheet, while others were jointed like the sections of a stovepipe; no solder was used as it would soon be taken up by the quicksilver, which was frequently used in the pan to catch the small flakes. The miner's pan was, in form, something like the common milk pan, but with the sides more flaring. The usual dimensions were ten inches across the top, and a little more than two inches deep. The rim was strengthened by a strong iron wire rolled in. This was the conventional miner's pan, result of thirty-seven years' experience.

The mode of using the pan in placer mining is as follows: Having removed the superficial earth to a point within a few inches of the bedrock, the miner placed a portion of the gravelly matter containing gold in his pan, and went to a neighboring stream, or pond, and kneeling by the side of the water, sank the pan containing the auriferous earth slowly beneath the surface, holding it horizontally, and causing the water to flow into the pan equally over the sides; when the pan was full, he lifted it out, and placing it on his knee or on a convenient stone, he stirred the mass with his fingers.

The skillful miner, in washing a panful of dirt, unconsciously divided the operation into five stages. He broke the lumps with his fingers and stirred the contents of the pan until a soft mud was formed. In sinking the pan beneath the water, the second stage commences. This was to so agitate the muddy prospect that gold, gravel, and coarse sand would sink to the bottom while the finer and lighter particles flowed over the rim. This being for a time continued, the remaining contents of the pan became clean and the water no longer loaded with slickens. The third operation was to carefully pick out all the large pebbles and gravel which were examined, and if found worthless were thrown aside and the agitation was continued with but little water in the pan. By a motion of the ball of the thumb, the coarse particles were raked out and rejected. At this stage a very large proportion of the original prospect had been removed, but every grain of gold lay at the bottom, although still invisible. The fourth operation was to so agitate the remaining contents of the pan (now inclined and only partly under water) that the coarse sand flowed over the edge in a thin stream, every particle passing under the eye of the operator, who made certain that no gold escaped. This was continued until but a small quantity remained in the pan, when, lifting the pan from the water, the last operation began, which was the concentration and perfect separation of the gold. This was effected by an undulatory motion, causing the sand to flow with the water across the bottom of the pan, revealing a cluster of gold particles, if the dirt was rich, wholly isolated. The miner then inclined the pan towards the sand, leaving the gold stranded in one portion, and the sand and water lying in the other. The edge containing the sand was then held over and very near the water, of which the miner lifted a small quantity in the hollow of his hand, and pouring it behind the sand, washed it away, leaving the gold only in the pan. There being no mercury used, the gold was collected by its specific gravity.

From this "prospect," the gold washer judged of the value of the claim. Each particle of gold, no matter how small, was called a "color."

In other countries, the same method is used but with different appliances. The Cornish miner tests the quality of his tin ores by washing on the blade of a shovel. The Mexican uses a horn spoon (cut from an ox horn), and the Brazilian uses the batea. The batea is considered as being superior to the miner's pan. It is a shallow, wooden dish or bowl (see Batea). (W)

Panning -- Washing auriferous gravels in an iron pan made for the purpose, to obtain the gold it contains. (D)

Pay Streak, or Pay Gravel -- In placer mining, a rich strip or lead of auriferous gravel. (D)

Piping -- In hydraulic mining, discharging water from the nozzles on the auriferous gravels. (D)

Pit -- A shaft; in hydraulic mining, the excavation in which piping is carried on. (D)

Pitch -- The inclination of a vein or of the longer axis of an ore body. (D)

Placer -- Ground of alluvial or diluvial origin, containing gold, tin, precious stones, etc., which are obtained by washing such ground with water. (D)

Pocket -- A rich spot in a placer mine or a rich body of ore. (D)

Pocket Mining -- Pocket mining is a characteristic feature of some portions on the "Mother Lode" district. This consists in the discovery and exploitation of small stringers, which, although not as a rule large enough or continous enough to pay for extensive operations, may yet contain considerable masses of free gold. Men who follow this form of mining usually work alone or in pairs, and often display much practical skill and ingenuity in following up the indications of a pocket. (W)

Prospecting -- Searching for new mineral regions, new mines, or bodies of ore; also, preliminary explorations to test the value of lodes or placers. (D)

Ranch -- A tract of land - farm, estate, residence. (D)

Riddle -- See Long Tom.

Riffle -- A cleat or groove in the bottom of a sluice to hold the quicksilver and catch the free gold. (D)

Rocker -- A "cradle"; a short trough provided with hopper, apron, riffles, etc., for washing auriferous gravels. (D)

Run -- The length of time reduction works or a hydraulic mine is kept in operation without stopping to clean up, make repairs, or for other purposes. (D)

Rush -- A sudden movement of a large number of miners to a new locality. (D)

Screen -- A sieve of wire cloth or perforated sheet iron used to sort ore and coal according to size (see Hydraulic Mining). (D)

Segregation -- A mineral deposit formed from concentration from the adjacent rocks. (D)

Self Shooter -- Automatic tripping device (see Booming).

Slickens -- The debris or tailings discharged from a hydraulic or placer mine (see Tailings). (D)

Sluice Box -- The next progressive step in placer mining was the sluice box, the great advantage of this method being that the sluice can be extended indefinitely and that by subjecting the rich dirt for a longer time to the action of the water, it becomes more fully disintegrated, and the gold set free. The increased riffle capacity permits the arrest of more gold; that portion which escapes the first settles in those below. A large proportion of the gold taken from California placers has been won by the aid of the sluice box, and the experience gained with them has led to their use, in an improved form in quartz milling and hydraulic mining.

The sluice box is made in sections of twelve feet in length, which vary in width from one to two feet. The box is made of three boards, a bottom and two sides. One end being wider than the other, to permit it being slipped together with other sections like the joints of a stovepipe.

The sluice extended as far as the miner wished; the water was brought to the head, and movable riffles were properly placed. Dirt was then shovelled in. After the dirt had been running some time, a little mercury was poured into the openings at the lower part of the riffles, and a larger quantity at the head of the sluice, which meeting the gold, arrests it and materially assists in the collection. In some sluice boxes, amalgamated copper plates were used. When not at work, it was necessary to guard the sluice box, as sluice robbing was very common, and the robbers exceedingly expert at the art. The most ingenious method was to take a silver spoon, and, after dipping it in quicksilver, to stir and dip up the stuff which lay just above the cross riffles. The excess was then removed by pressure. (W)

Sluicing -- Washing auriferous earth through long races or boxes, provided with riffles and other gold saving appliances, and called sluices. (D)

Slums -- The discharges from the hydraulic mines (see Tailings). (D)

Strip -- To remove from a ledge or quarry the overlying earth, loose rocks, etc. (D)

Tailings -- The debris, detritus, or slums discharged from the hydraulic mines, and which consist mainly of silt, sand, and gravel, intermixed with the water that carries them off. (D)

Undercurrent -- A large flat box or platform, placed beside and a little lower than the main sluice, from which it receives a portion of its contents, and carrying them to the lower end of the undercurrent there returns them to the sluice. This apparatus is paved and riffled like the sluice, but being much wider than the latter, allows the water to spread out in a thin sheet over its surface, thereby so abating the force of the current, that the very fine gold, including the rusty particles, are more apt to be caught here than in the sluice. (D)

Vanning -- Washing ore on a shovel analogous to panning. (D)

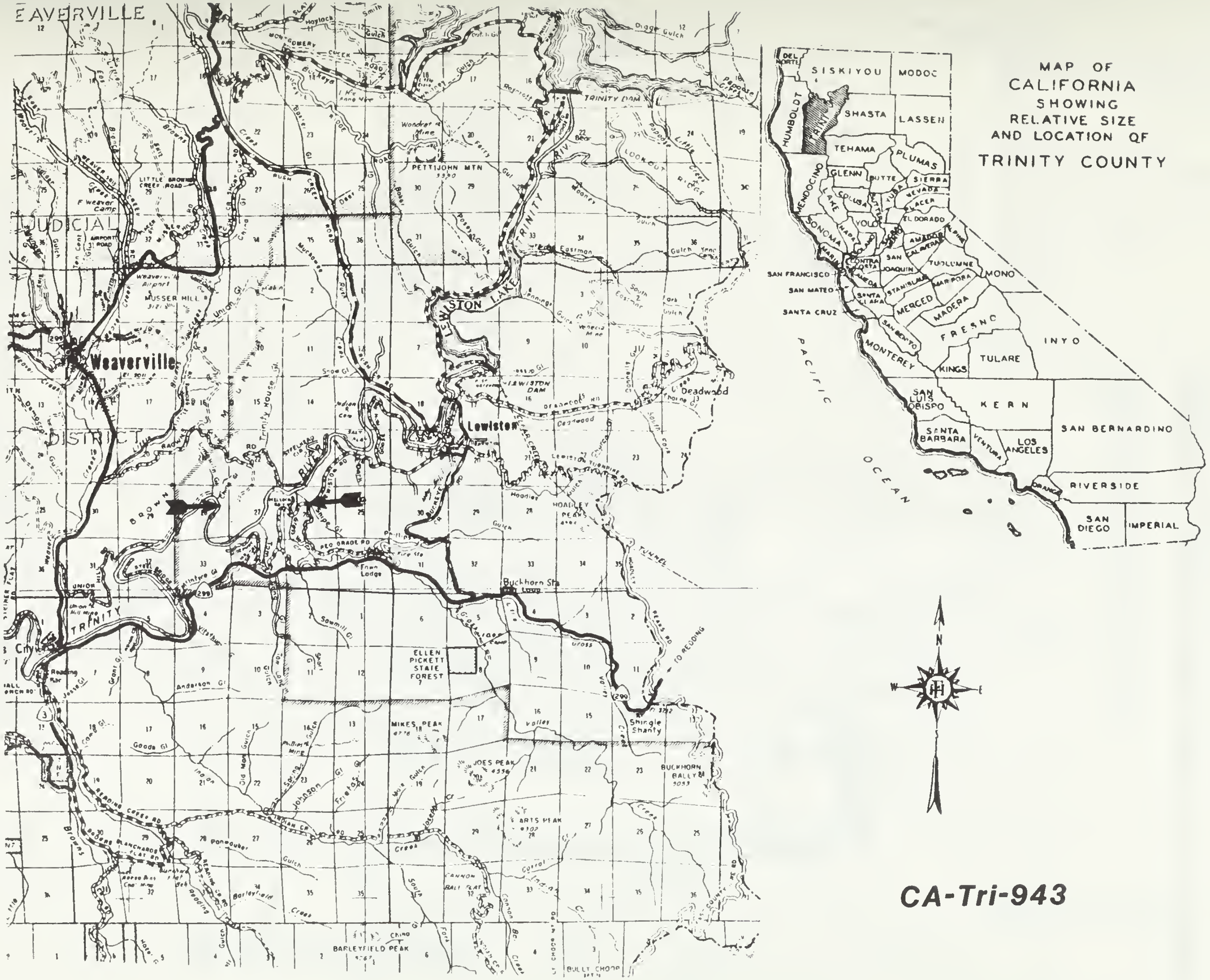
Weathering -- Changing under the effect of continued exposure to atmospheric agenices. (D)

Winch, or Windlass -- A man-powered hoisting machine in which the rope (wound wire cables are commonly called ropes) is wound on a shaft or drum worked with crank handles. (D)

Zanja -- A ditch, a trench. (D)

Appendix B

MAPS

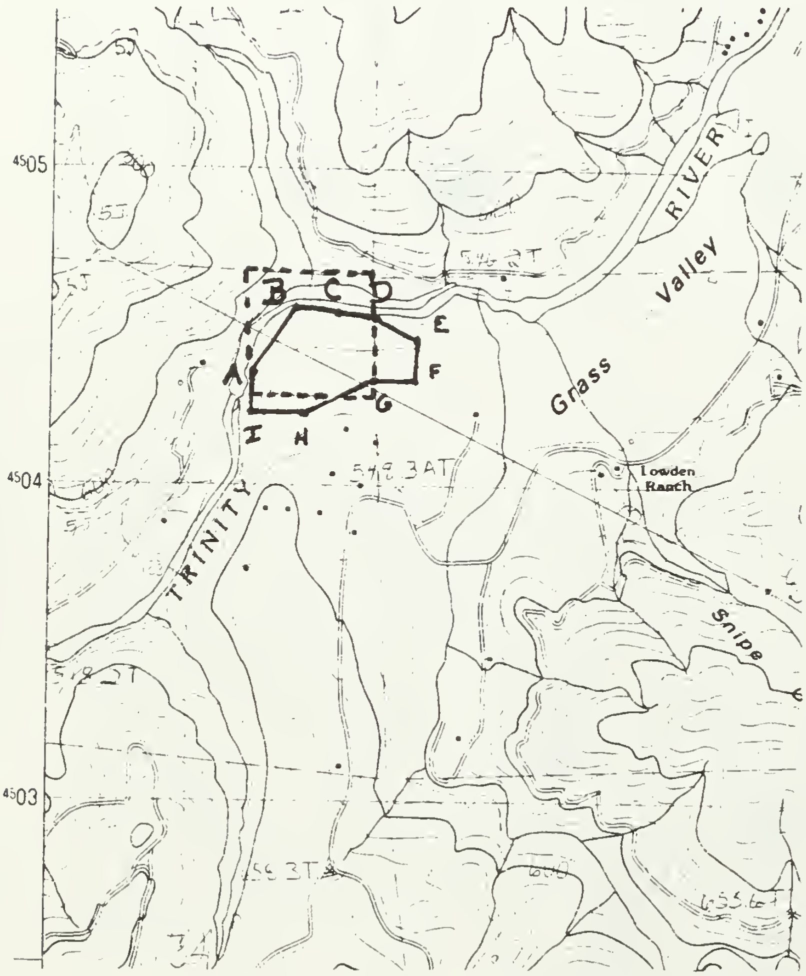


MAP 1 of 6

OHIO FLAT MINING DISTRICT
GENERAL LOCATION

BUREAU of LAND MANAGEMENT PARCEL

ACTUAL AREA SURVEYED



LEWISTON, CALIF.

PROVISIONAL EDITION 1982

40122–F7–TM–024

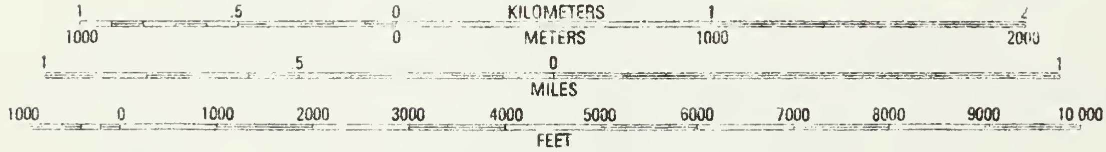
CA-Tri-943

QUADRANGLE LOC…

1	2	3	1 Rush … 2 Trinity Dam 3 Papoose Creek 4 Weaverville 5 French … 6 Hoos… 7 Bully Choop … 8 Shasta …
4	2	5	
6	7	8	

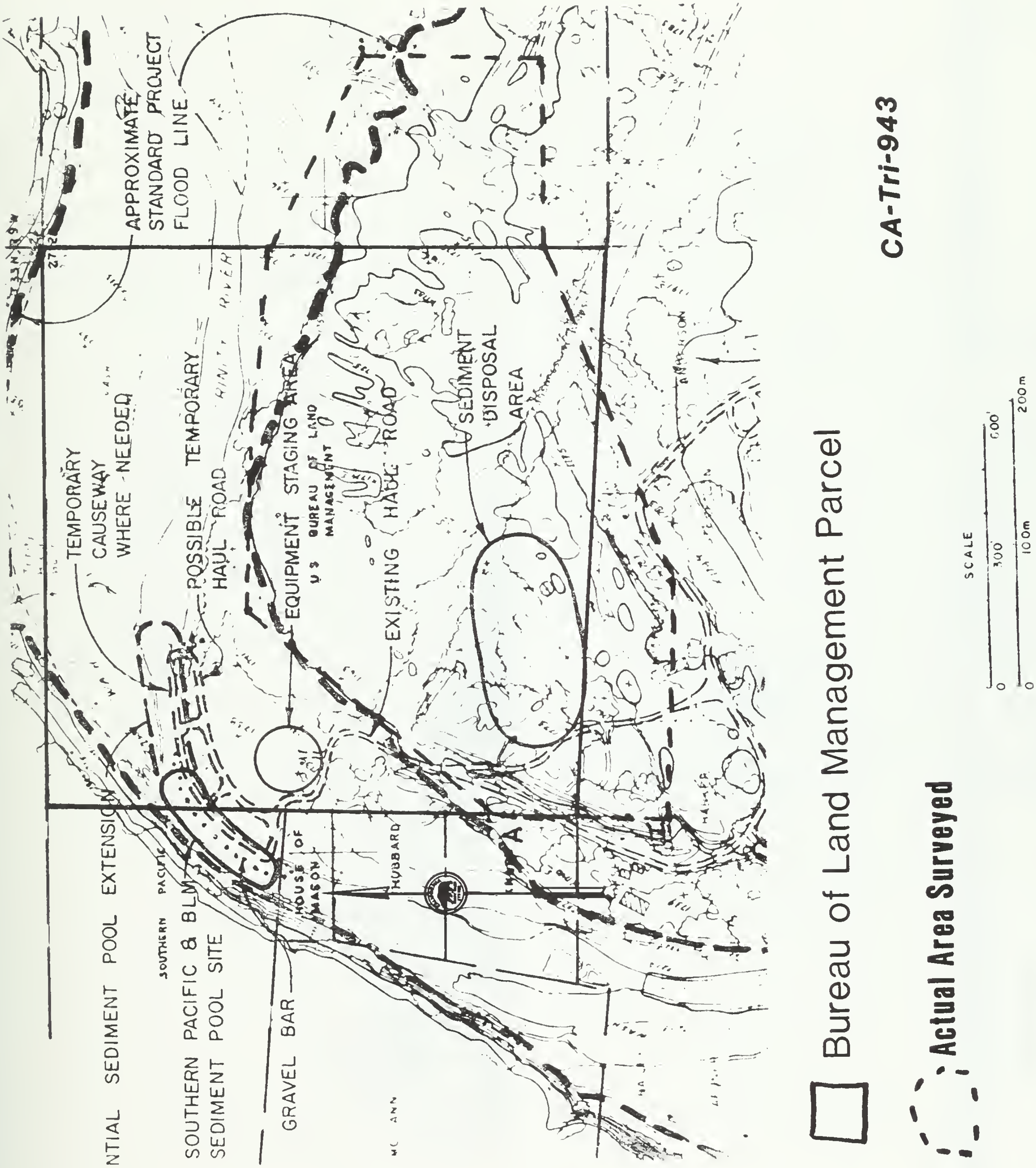
ADJOINING 7.5' QUADRANGLES

SCALE 1:24 000



CONTOUR INTERVAL 20 METERS

MAP 2 of 6	OHIO FLAT MINING DISTRICT PORTION OF LEWISTON 7.5' U.S.G.S. QUADRANGLE PROVISIONAL EDITION, 1982



MAP 3 of 6 — OHIO FLAT MINING DISTRICT BUREAU OF LAND MANAGEMENT PARCEL AND ACTUAL AREA SURVEYED FOR ARCHEOLOGICAL VALUES


Trinity River
N
50 0 100 200 300
SCALE IN FEET
TRINITY RIVER SEDIMENT DISPOSAL SIT
TRINITY RIVER GRASS VALLEY CREEK
SCALE : 1"= 50' COMPILATION SCALE : 1"=150'
CI = 2'
DESIGNED
DRAWN
CHECKED
DATE
REVISIONS
RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
APPROVED
DATE
TRINITY RIVER SEDIMENT DISPOSAL SITE
DRAINAGE
DRAWING No.
SHEET No.
4
OF
6


Trinity River
N
SCALE IN FEET
TRINITY RIVER SEDIMENT DISPOSAL SITE
TRINITY RIVER GRASS VALLEY CREEK
DESIGNED
DRAWN
CHECKED
DATE
REVISIONS
RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
APPROVED
DATE
TRINITY RIVER SEDIMENT DISPOSAL SITE
DRAINAGE BOUNDARY & CORED TREES
DRAWING NO.
SHEET NO.
5 OF 6

N
SCALE IN FEET
50 0 100 200 300
retaining wall
stone alignment
stone dam
pit, depression
stone pavement
ground sluice
stone, earth pile
rust/oxide stain (Area 15)
TRINITY RIVER SEDIMENT DISPOSAL SITE
TRINITY RIVER GRASS VALLEY CREEK
CI = 2'
DESIGNED
DRAWN
CHECKED
DATE
REVISIONS
RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
APPROVED
DATE
TRINITY RIVER SEDIMENT DISPOSAL SITE
HISTORIC FEATURES
DRAWING NO.
SHEET NO.
6 of 6

Appendix C

FIGURES

FIGURE 1: Section of hand made Iron Pipe. Note use of cut nails as rivets. See plates 11, 13 & 14. Acc. #P611-1

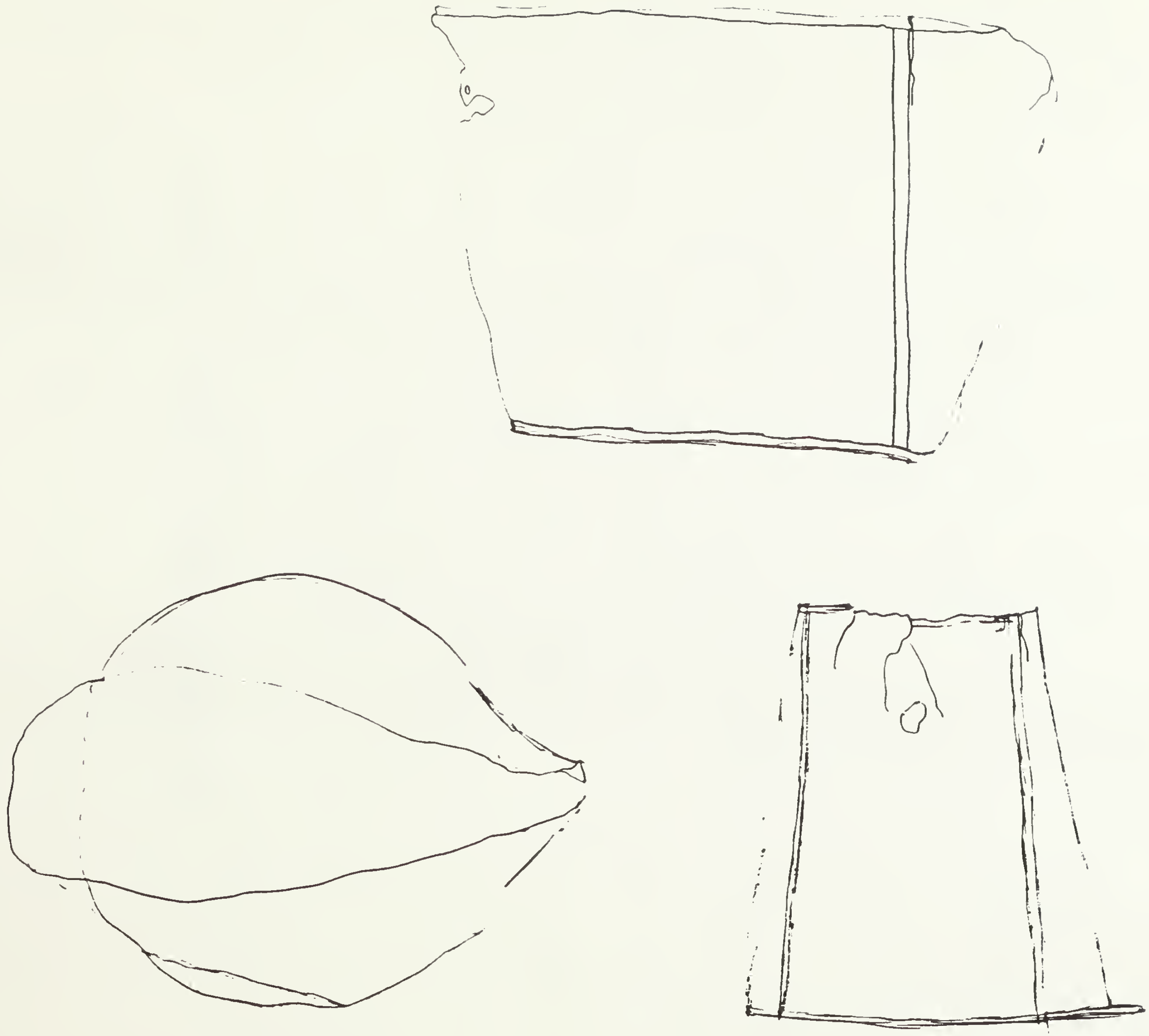


FIGURE 2: Tin Can. Note bend in top to make pouring spout and two double overlap seams. See plates 15 & 16. Acc. #P611-2

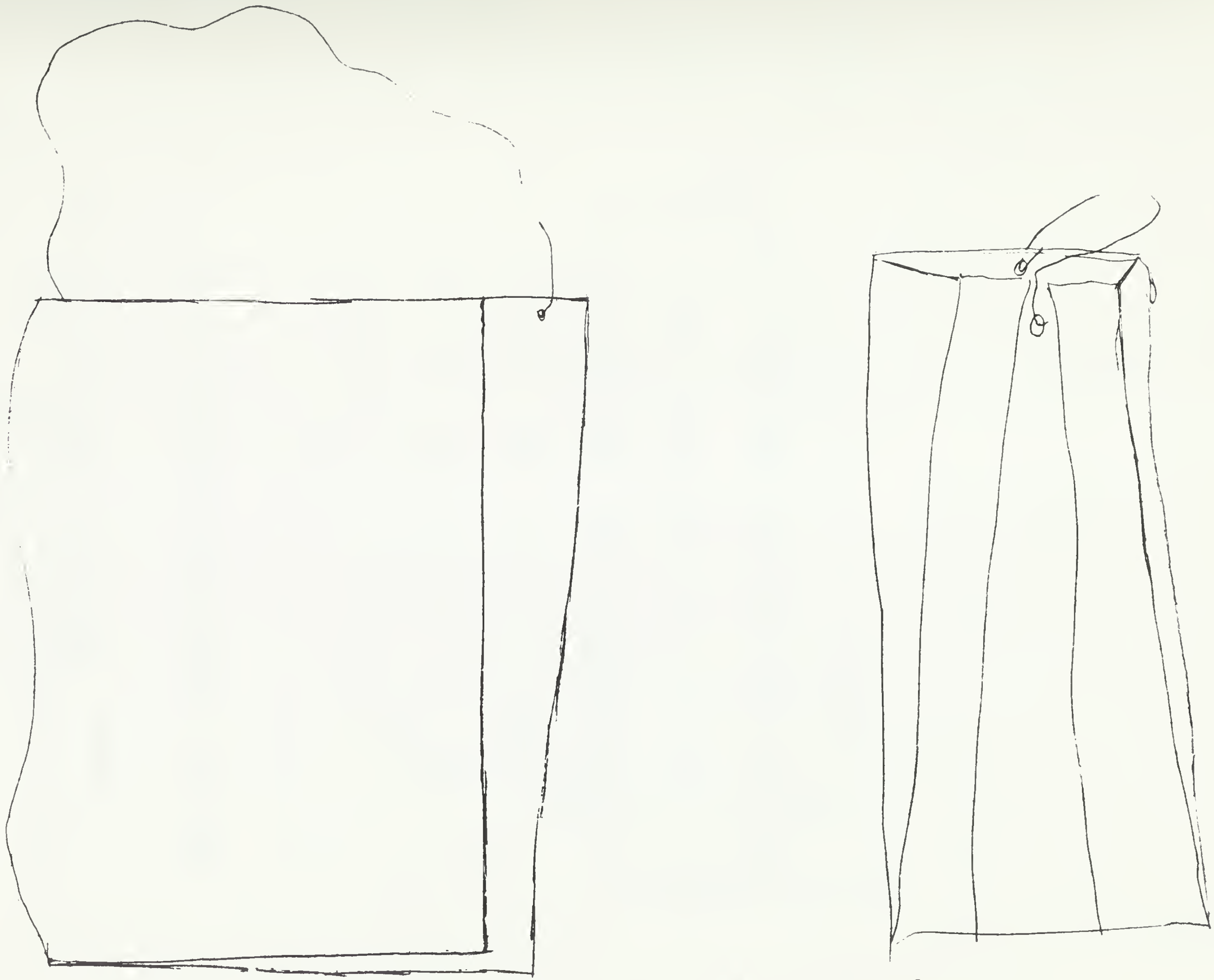


FIGURE 3: Tin Can. Note wire bale. See plates 17 & 18 for more detail. Acc. #P611-3

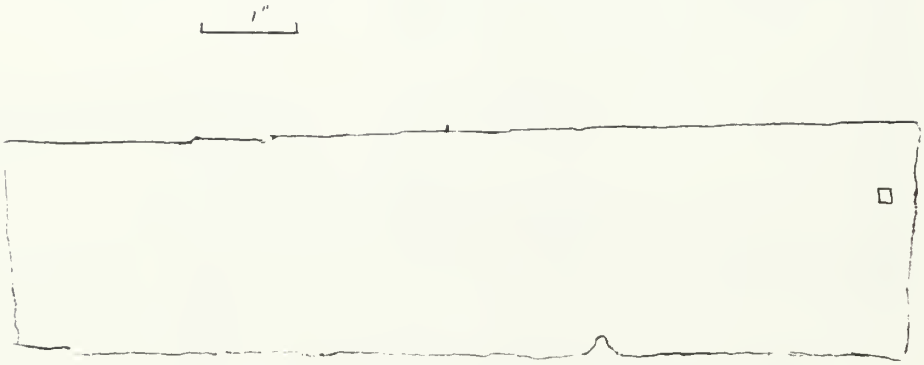
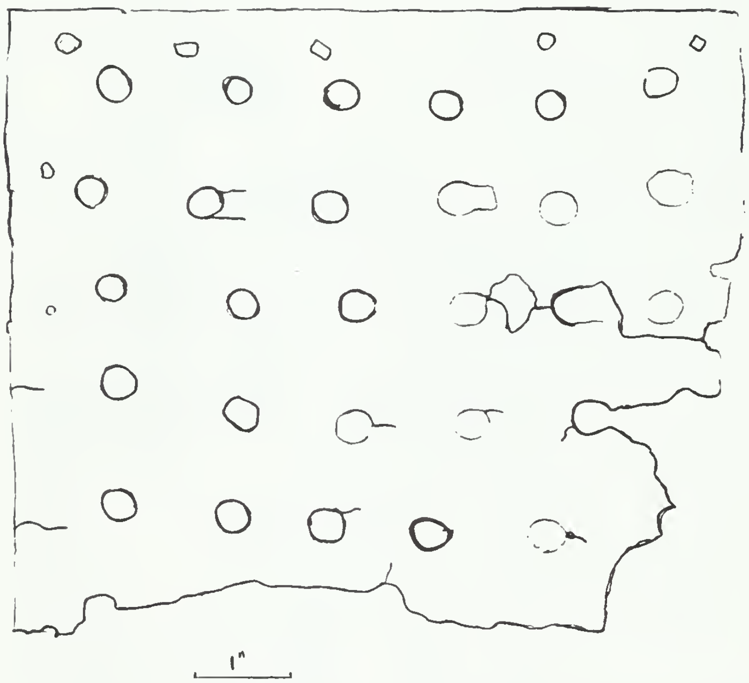


FIGURE 4: Iron or Steel Strap. .025" thick. See plate 19. Acc. #P611-4



note cut nail holes around perimeter .02" thick

FIGURE 5: Perforated Iron Plate, possibly "Grizzly Plate". See plate 20 and Glossary. Acc. #P611-5

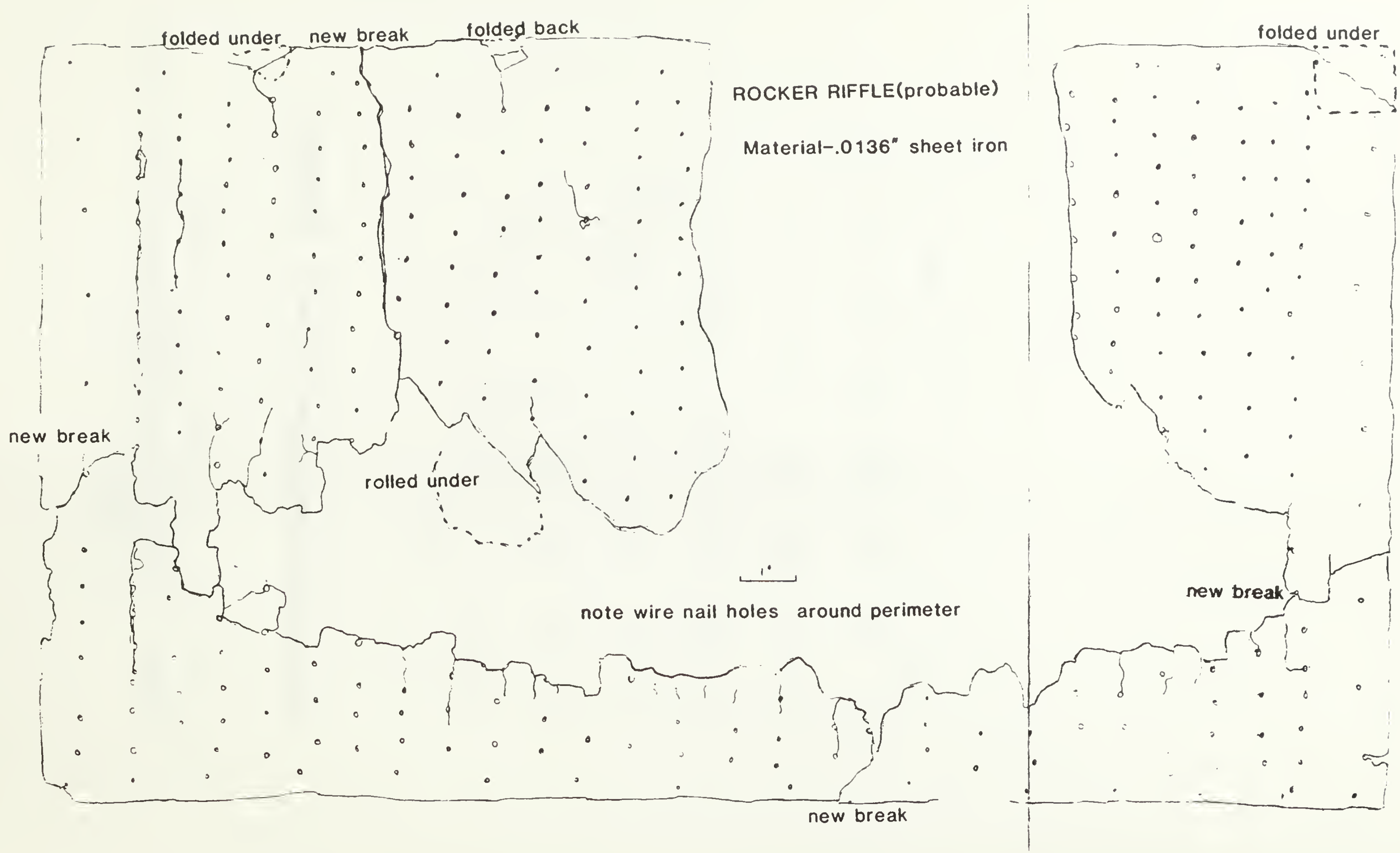


FIGURE 6: Perforated Iron Plate, possibly a riffle or bottom plate from a Rocker. See plates 21 through 24.
Acc. #P611-6

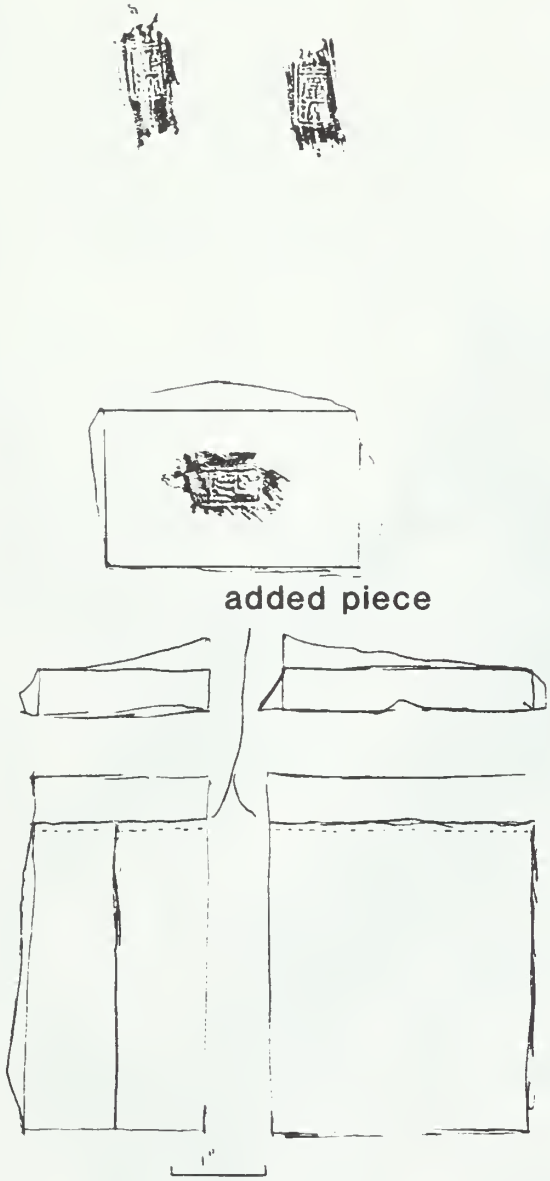


FIGURE 7: Opium Tin. See plates 25 & 26.
Acc. #P611-7

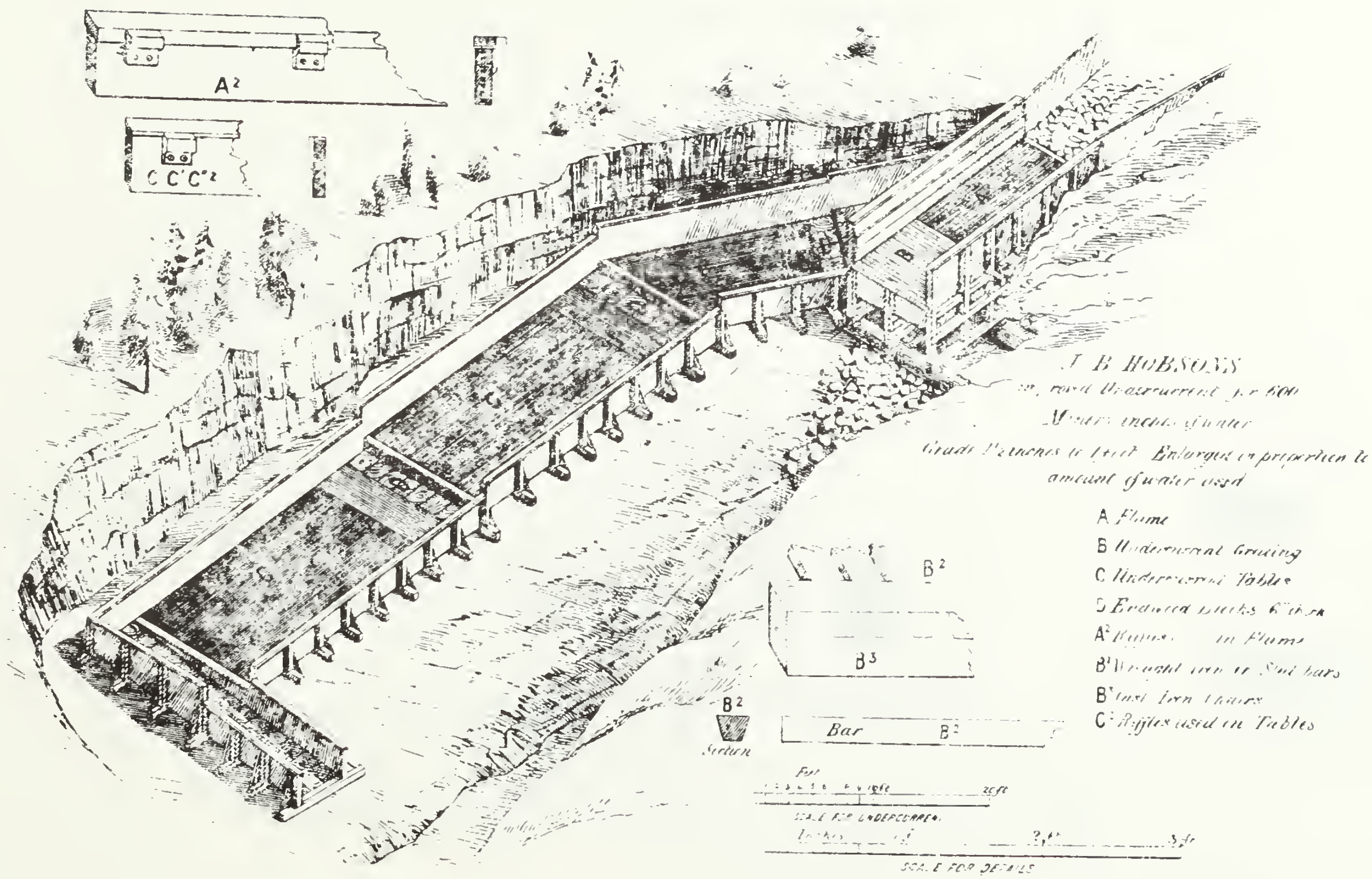


FIGURE 6: Sluices and undercurrents showing one method of working an area similar to Ohio Flat (after John H. Hammond's 1890 The Auriferous Gravels of California in the Ninth Annual Report of the State Mineralogist, California State Mining Bureau, Sacramento (pg. 131).

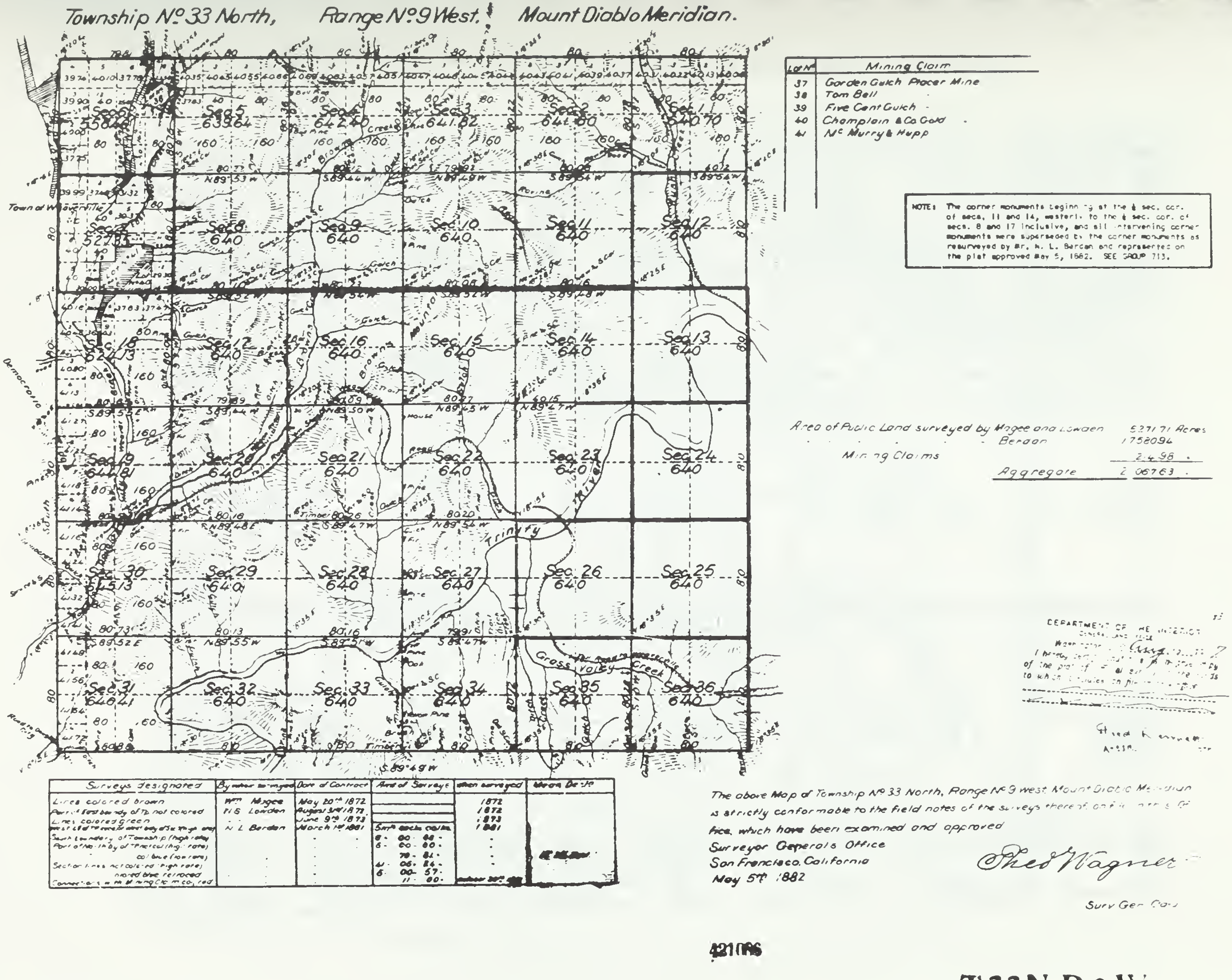


FIGURE 9: 1882 Government Land Office plat of township (note ditches and trails leading to Section 27.

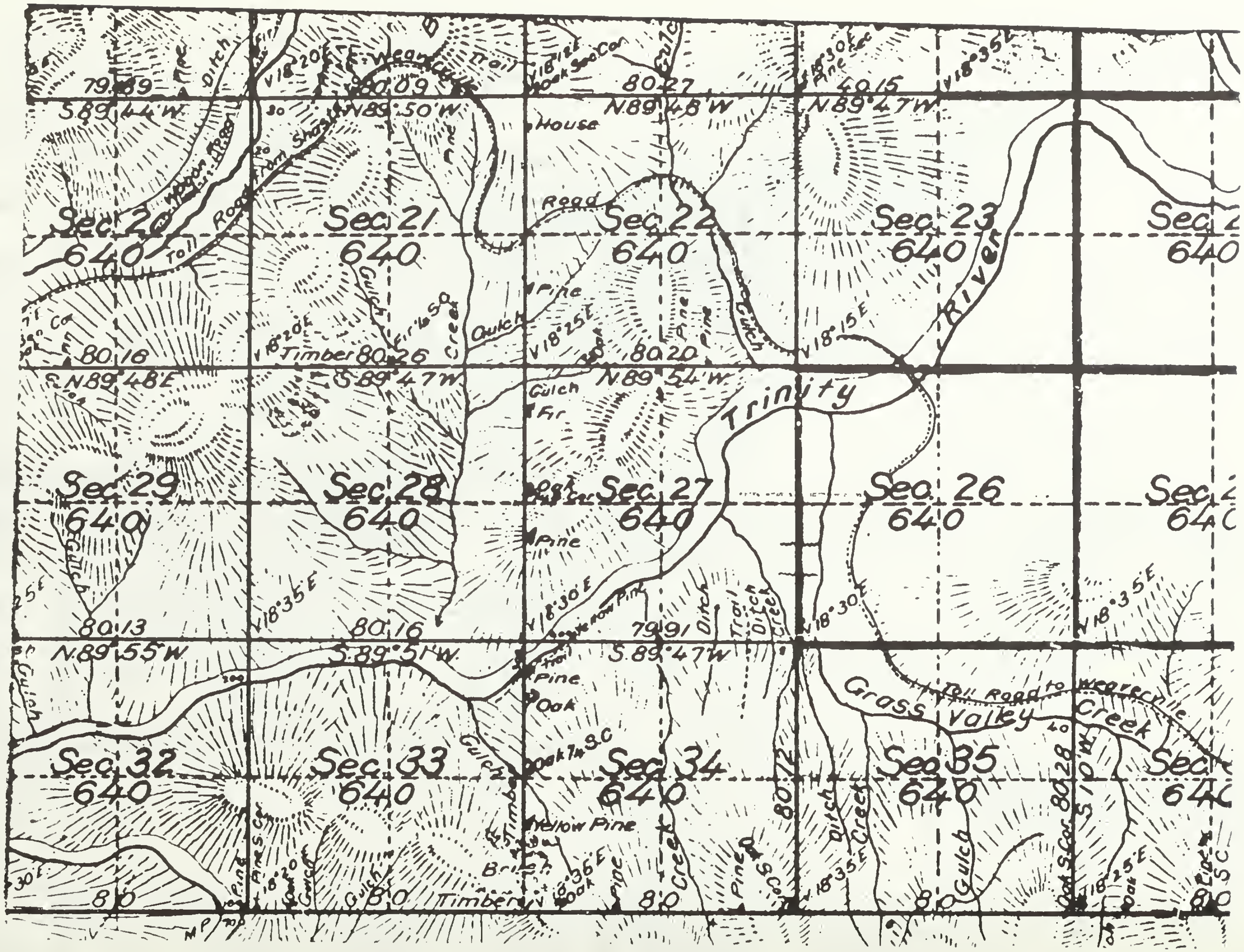


FIGURE 10: Closeup of historic 1882 plat of site area in Section 27.

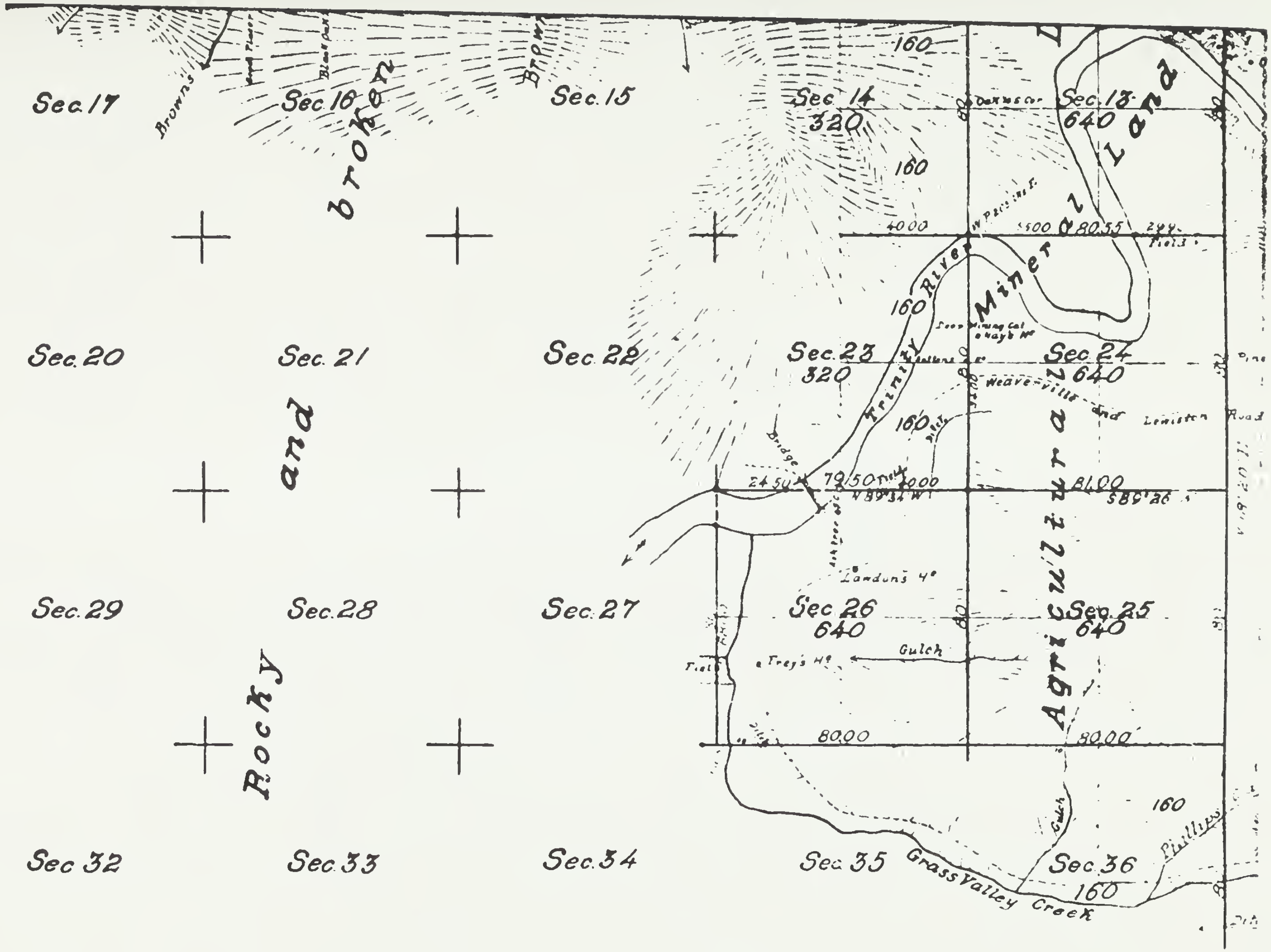


FIGURE 11: 1873 Government Land Office plat of township (closeup of site area--Sec. 27).

Appendix D

PLATES

PLATE #1:

Old, possibly early shallow placering remains. This area may predate the She Lim Company claim and possibly represents the earliest mining efforts within the parcel. There is some evidence of shallow ground sluicing in the area. This surface is in Survey Unit #19.

PLATE #2:

Ditch in foreground and possibly original ground surface. Soil overburden is moderatly developed containing a mix from sand grain to boulder sized rocks. Soil surfaces of this type are visible in Survey Units #19 & #21.

PLATE #3:

Sluice showing small flat rocks thrown out along edges. Ground sluices of this type are visible in Survey Units #6 & #8.

PLATE #4:

Detail of old surface showing the head wall of a shallow ground sluice. The depth of this sluice is only 3 to 5 feet below the surrounding surface. Rock in foreground has been removed and stacked as banks were removed. This sluice is in Survey Unit #20

PLATE #5:

Detail of dam in foreground and ditch in background. This dam and ditch are in Survey Unit #20.

PLATE #6:

Rock stacking typical of several areas in parcel. The stack in the foreground is in Survey Unit #20.

PLATE #7:

Rock lined ditch through tailings piles. These ditches occur in several areas in the parcel. Note Pseudotsuga menziesii (Douglas fir) in background, growing from ditch bottom. This ditch is in Survey Unit #8.

PLATE #8:

Detail of edge of sluice ditch showing small flat rocks stacked along edge. These flat stones could have been part of the sluice bottom cleaned out during gold retreival operations. This edge area is adjacent to the test excavation conducted by Herb Dallas. This sluice is in Survey Unit #8.

PLATE #9:

Depression or ditch in stacked rock pile. These depressions range from 6 to 8 feet in depth and from 10 to 14 feet in diameter. The purpose of the depressions has not been identified. This depression is in Survey Unit #15

PLATE #10:

Rock pile on rock covered ridge. There are a number of these small piles in several areas in the parcel. These piles characteristically occur in alignments about 8 to 10 feet apart. They are probably the remnants of foundation piers for wooden flumes or iron or wooden water pipes. A visual check of these alignments of piles show that they generally maintain grade. This rock pile is in Survey Unit #15.

PLATE #11:

Fragment of iron pipe riveted with bar cut nails(artifact catalog #P611-1). This pipe fragment was discovered in Survey Unit #19 and may be part of a water supply pipe which ran through that survey unit.

PLATE #12:

Detail of lighweight iron sheet(strap?) possibly part of a "tin" artifact. This sheet was discovered in Survey Unit #10. Although this sheet was not collected other artifacts of the same approximate thickness were collected and catalogued as #P611-2 and #P611-3(see artifact photographs following).

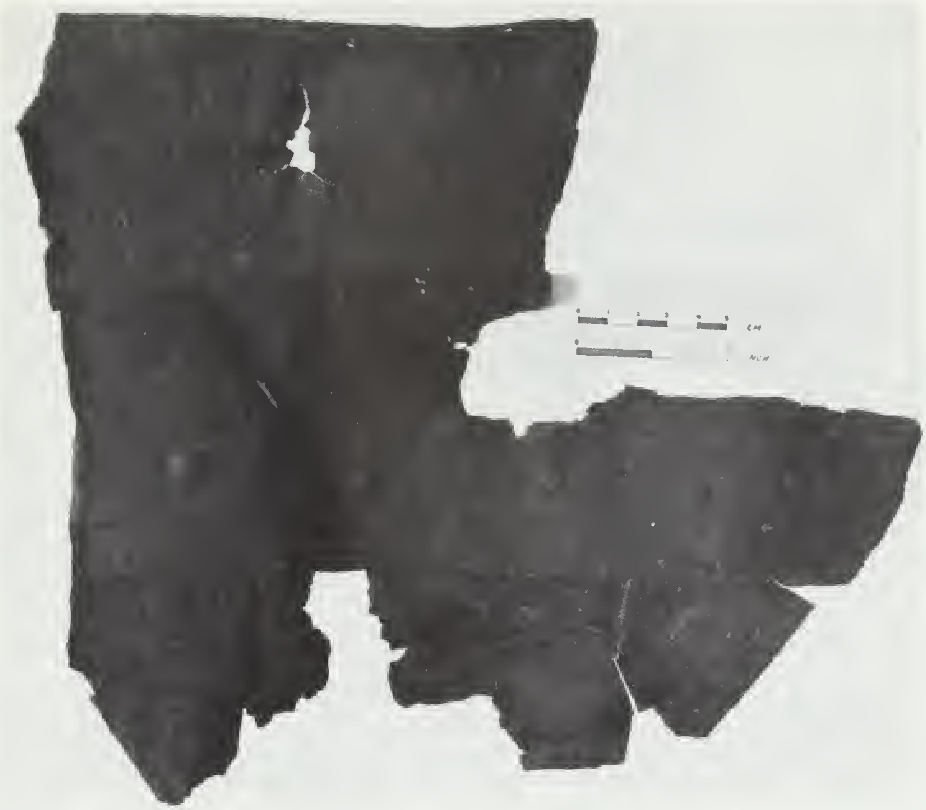


PLATE #13: Iron Pipe section-exterior-note cut nails used as rivets-see plates 11 & 14(ACC. #P611-1)

PLATE #14: Iron Pipe section-interior-see plates 11 & 13

PLATE #15: Tin Can-note bend in top to make spout-see plate 16(ACC. #P611-2)

PLATE #16: Tin Can-note two double overlap seams. The multiple seams could mean that this was manufactured locally pieces of other containers-see plate 15.

PLATE #17: Tin Can-note bead of melted solder on lower right-see plate 18(ACC. #P611-3)

PLATE #18: Tin Can-note line of melted solder on lower portion of side-see plate 17.

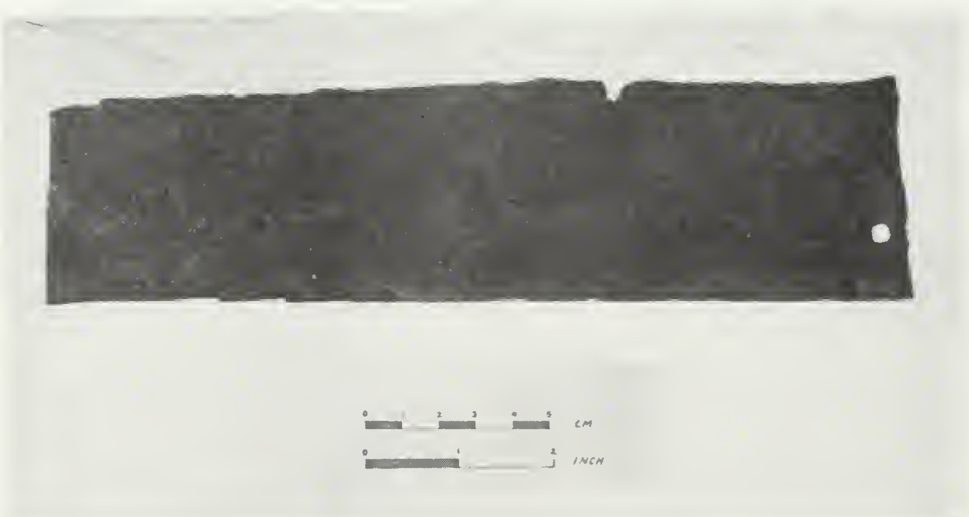


PLATE #19: Iron Strap(ACC. #P611-4)

PLATE #20: Perforated Iron Plate-note cut nail holes around perimeter. This is most likely part of a sluice bottom and may be a fragment of a Grizzly Plate-see Glossary, Appendix A(ACC. #P611-5)

PLATE #21: Perforated Iron Plate-possibly a riffle or bottom plate from a rocker box-note wire nail holes around perimeter. Although almost the entire plate was collected it subsequently broke into several fragments. See plates 22-24(ACC. #P611-6)

PLATE #22: See plate 21 for legend

PLATE #23: See plate 21 for legend

PLATE #24: See plate 21 for legend.

PLATE 25: Opium Tin. See figure 7. Brass tin with soldered seams. Note, top piece is applied. Acc. #P611-7

1"

PLATE 26: Opium Tin Lid. See figure 7 and plate 25. Brass lid with soldered seam and stamped Chinese character.
Acc. #P611-7

PLATE 27

Stone lined ditch for water diversion within Survey Unit #10. View southeast.

Stone lined ditches for water diversion (same as in above photo). View west.

PLATE 28

Stone alignment and ditches within Survey Unit #10. Some of these alignments may have been bases for flumes.

Major drainage ditch with terraced stone alignments within Survey Unit #10. View west.

PLATE 29 Alexander Swain Mine, 1860, on Whiskey Creek under Clear Creek Flume of John P. Jones (Shasta County). Stone alignments and workings are similar to those of Ohio Flat. Photo courtesy of the Redding Museum and Art Center.

DATE DUE

GAYLORD			PRINTED IN U.S.A.